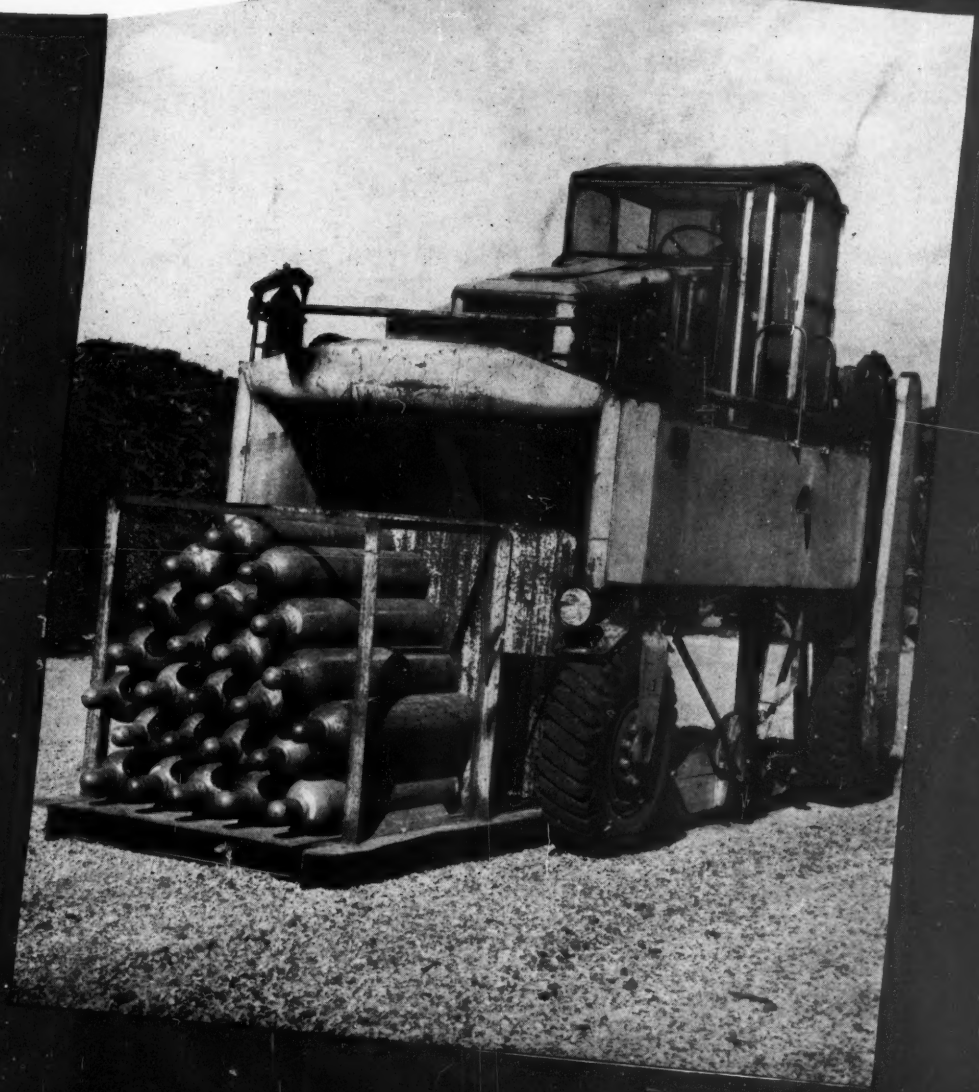
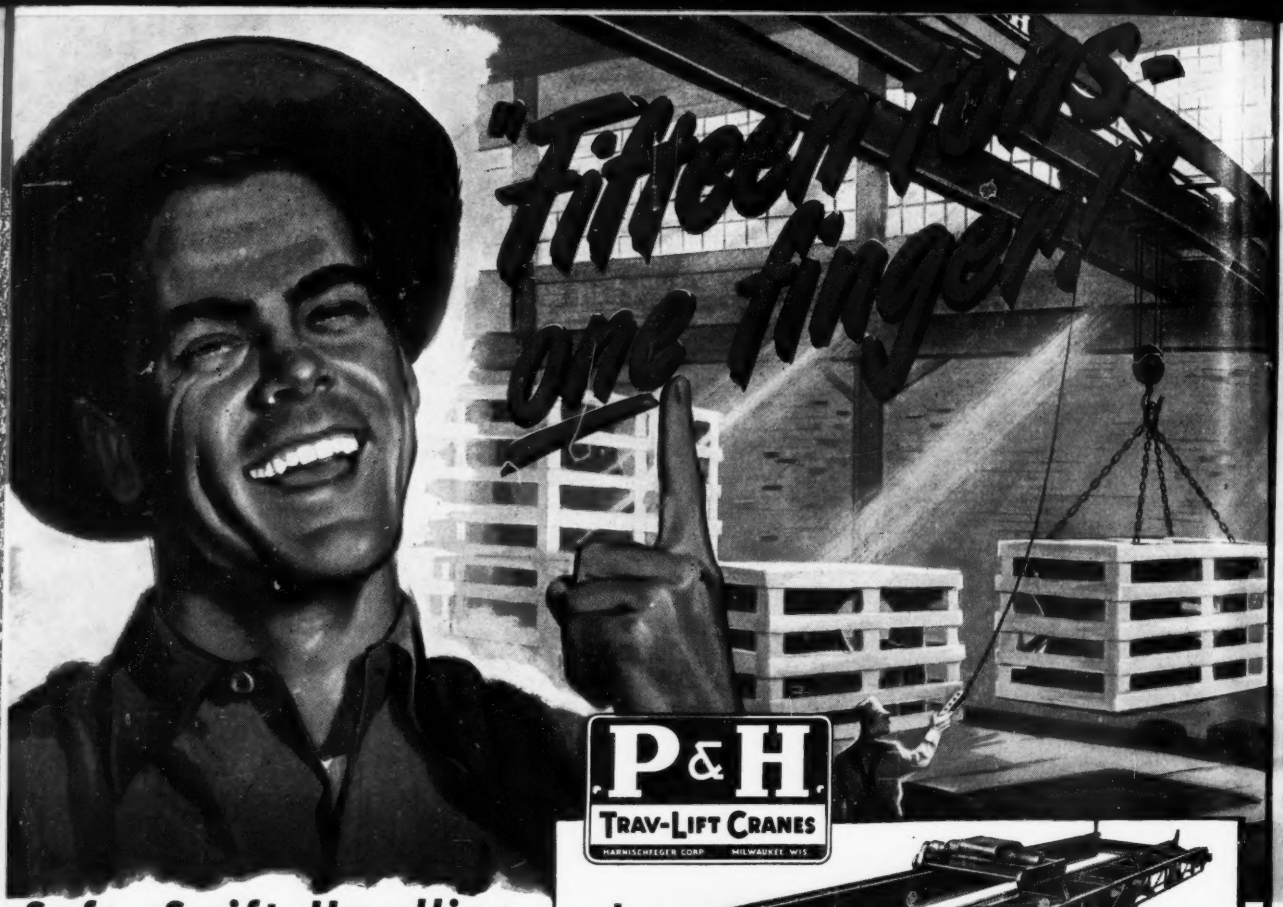
PUBLIC LIBRARY
JUN 21 1948
DETROIT

Flow

THE MAGAZINE OF MODERN MATERIAL HANDLING AND PACKAGING METHODS



1948 FLOW Cost Analysis Contest Announcement — see page 18



Safe, Swift Handling Pays Dividends!

● Yes, with finger-tip precision, one man masters ponderous loads — lifting, lowering, transporting, stacking — from any point to any other in the area served by a Trav-Lift Crane. *And all without rehandling.* With P&H variable speed push-button control you have the power, speed and versatility that pays real profits in time and money saved.

Rugged design, rigid welded construction and especially designed electrical equipment assures you of safe, dependable service for many years to come. Built by America's leading producer of overhead materials handling equipment.

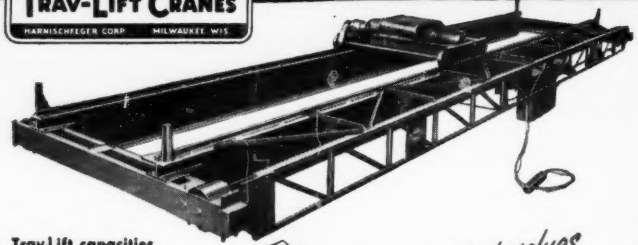
Where your service requirements do not warrant investment in a heavy duty crane, the P&H Trav-Lift is the answer. Ask us to send Bulletin H-13-1.

P&H

ELECTRIC HOISTS
4643 West National Avenue
Milwaukee 14, Wis.

HARNISCHFEGER CORPORATION
ELECTRIC CRANES • EXCAVATORS • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

P&H
TRAV-LIFT CRANES
HARNISCHFEGER CORP. MILWAUKEE, WIS.



Trav-Lift capacities run up to 15 tons.

These added values protect your investment

VARIABLE SPEED FULL MAGNETIC CONTROL provides 5 distinct steps for all motions; controlled from pendant push-button or from operator's cab.

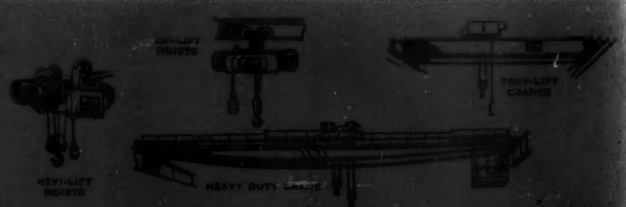
SAFE — Only 110 volts at the push-button when floor-controlled. Start-stop main line contactor, disconnect switch, thermal overload protection, magnetic limit switch and powerful brakes assure maximum safety.

ALL-WELDED BRIDGE AND TROLLEY incorporates the most important factors in reliable service — rigidity, safety, accessibility.

LIFE-TIME CONSTRUCTION — Motors designed specifically for crane service — high starting torque, frequent reversal, etc. Shaved gears, grease sealed anti-friction bearings throughout.

COMPETENT ENGINEERING SERVICE — P&H materials handling engineers will gladly bring their years of experience to bear on your particular problems. Write us.

Handle it "thru-the-air" at lower cost



Only Skylift ELECTRIC TRUCKS GIVE YOU High Pressure Hydraulic Lift

Skylift takes load through low doorways, then tiers the product inside, with low ceilings no handicap. BELOW, you see the same Skylift tiering 130 inches high in high-ceiling warehouses . . . a dual operation made possible by high pressure hydraulic lift.

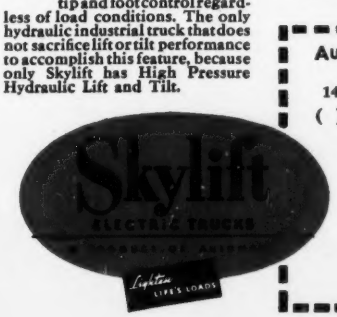
Automatic is First With Most Great Features

1 Caster type steering axle, center pivoted and shock-proof. Compensates for uneven floor conditions. Provides easier steering, prevents transmission of road shock to steering wheel.

2 Air-cooled disk brake. Mounted on end of motor where brake torque is least. This greatly prolongs life, gives greater braking surface, insures positive and smooth stopping.

3 Full automotive type controls. Brake pedal and foot accelerator same as a car. One lever controls lift and tilt, the other forward and reverse. NEW-matic controller gives smooth, timed automatic acceleration through all speeds.

4 Lift, tilt and drive simultaneously or independently with easy finger-tip and foot control regardless of load conditions. The only hydraulic industrial truck that does not sacrifice lift or tilt performance to accomplish this feature, because only Skylift has High Pressure Hydraulic Lift and Tilt.



● Before you buy any industrial truck ask: "Has it *high pressure* or *low pressure* hydraulic lift?" You see, here is why it's so important to you.

Low pressure systems are fast becoming antiquated. *High pressure* hydraulic lift is a *modern, up-to-date system*—it is compact and efficient—and therefore, trucks so equipped can be much smaller in design to obtain better results.

There are other advantages, too. With Automatic's exclusive patented design, using *high pressure* hydraulics, you can *raise forks to maximum height of single lift,* before *increasing overall height of uprights.* Forks raise 67 *inches before uprights begin to extend!*

As you see by the pictures at the left, you get easy entry into box cars and other low clearance portals. You tier to maximum height without uprights jabbing into ceilings. The same Skylift also tiers up to 130 inches high, giving you a complete handling system for both LOW and HIGH CLEARANCE moving and tiering.

Only Automatic Skylifts offer you this double-duty money-saving feature, because ONLY Skylift Electric Trucks are equipped with HIGH PRESSURE Hydraulic Lift. No other industrial trucks have it, no others can offer it, because it is a PATENTED Automatic feature. Mail coupon.

Only Automatic GIVES YOU "BURN-OUT PROOF" Silicone Insulated Motors

● Constant starting, stopping, reversing and overloading gives a motor an awful beating—often causes overheating, which means motor failure, trucks out of service.

Automatic foresaw the demands which would be put on Skylift Electric Trucks, so gave you the protection of SILICONE MOTOR INSULATION. This is an exclusive silicone varnish and silicone lubricant that protects Skylift motors, even if overloaded, and even after exposure to temperatures of 300 to 400 degrees Fahrenheit.

This means no armature or field coil failure, no trucks laid up for motor repair, no interruption of Skylift's smooth, efficient money-saving material handling operation. NO OTHER industrial trucks offer this EXCLUSIVE feature! Mail coupon.

AUTOMATIC TRANSPORTATION COMPANY
DIV. OF THE YALE AND TOWNE MFG. CO.
141 W. 87th St., Dept. F-8, Chicago 20, Ill.

( ) Send details on Automatic's Skylift Electric Trucks and *exclusive* HIGH PRESSURE HYDRAULIC LIFT.

( ) Have an ATCO Specialist make a free survey of our material handling costs.

Company Name.....
By.....
Street Address.....
City.....Zone.....State.....

You Need MH* to Speed Production!

*M H is MASS HANDLING—the systematic movement of the most units, in the shortest time, at the lowest cost.

REVOLVING CARRIAGE

TOWMOTOR CORPORATION
Division 8, 1226 East 152nd Street
CLEVELAND 10, OHIO
REPRESENTATIVES IN PRINCIPAL CITIES

DO YOU REALLY NEED A NEW PLANT?

Better check first to see how Towmotor Mass Handling can speed up production in your present plant. Handling materials and products the modern, efficient way—with Towmotor Fork Lift Trucks and Tractors—steps up productive output by insuring maximum use of present production time, manpower and equipment. In any plant, large or small, Towmotor Mass Handling has a great deal to offer . . . get the complete story about MH today.

SEND FOR FREE BOOK
The Towmotor Materials Handling Analysis Guide shows you how to analyze and improve handling operations in your plant.

TOWMOTOR *THE ONE-MAN-GANG*

Fork Lift Trucks *and* Tractors

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

JUNE, 1948
VOLUME 3, No. 9

Flow

COVER PHOTO—This straddle truck and specially designed all welded rack avoid the handling of individual tanks of oxygen acetylene in burning scrap at the Steel and Tube Div. of The Timken Roller Bearing Co. The whole rack is moved from place to place in the extensive yard. The deck is ¼" steel plate with ½" x 6" x 6" angle iron for ears. Individual cylinders are removed only when the rack is reloaded with full ones in the store room.

EDITORIAL DEPARTMENT
MANFRED SCHUELER, Editor
HENRY F. EATON
Associate Editor
PRODUCTION DEPARTMENT
WM. V. LINAS, Director
CIRCULATION DEPARTMENT
E. J. HEXTER, Director
FLOW EDITORIAL AND BUSINESS OFFICES—
HAROLD F. BEHM, Business Manager
L. L. OPPENHEIM,
1240 Ontario Street,
Cleveland 13, Ohio
Phone: Prospect 1251
NEW YORK OFFICE—
LEE HAAS
19-25 W. 44th Street
Room 412
New York 18, New York
Murray Hill 7-3420
CHICAGO OFFICE—
NORMAN J. LOTT
64 E. Lake Street, Room 1013
Chicago 1, Illinois
Andover 4972
LOS ANGELES OFFICE—
ROBERT H. DEIBLER
2506 West 8th Street
Los Angeles 5, California
FE-0303

Subscriptions—By the year, $3.00; Two years, $5.00; Single copy, 30 cents.

Foreign Subscriptions—Canada, $4.00 per year, Two years, $6.00; Foreign, $5.00 per year flat. Subscriptions received after the first of the month will be effective the second month following. Example: those received after May 1st will start with the July issue.

Copyright 1948 by The Flow Publishing Co., All communications should be addressed to FLOW Magazine, 1240 Ontario Street, Cleveland 13, Ohio. IRVING B. HEXTER, Pres., LESTER P. AURBACH, V-P.

Flow Magazine is affiliated with the Industrial Publishing Company, which also publishes:

APPLIED HYDRAULICS
DIE CASTINGS
TAXICAB INDUSTRY
INDUSTRY AND WELDING
OCCUPATIONAL HAZARDS
REFRIGERATION INDUSTRY

ECA

In This Issue

Features

Mechanical Handling . . . Life Saver—flow at this leading candy company 15
SIX TONS Of Salt IN THREE MINUTES—municipal ice control.... 17
THREE-DIMENSIONAL Layout Planning—with step-by-step examples 19
RECORDS—Blueprints For PRODUCTION—a survey article 22
SAVED: 30% Of Investment In Only One Year—FLOW contest winner, Part II 26
Coils Ride The MONORAILS—a new J&L warehouse..... 32
"We HID THE CEILING"—well-planned conveyor assembly triples production in the same floor area..... 36

Packaging Mechanics Section

1. Packing Geared To High-Volume Production—at Electrolux 50
2. Wax Cools On Way To Packing—S. C. Johnson & Son operation 54
3. Improved Crating Produces SHIPPING SAVINGS 52

Departments

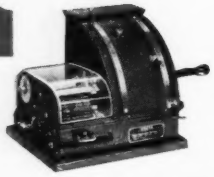
On The Pallet—news, views, trends 44
New Products—equipment, accessories of interest 57
New Literature—free material from manufacturers 60
Opportunities—lines and personnel wanted, positions available, etc... 61

WEBER TAG AND LABEL ADDRESSING MACHINES and imprinting devices for every requirement

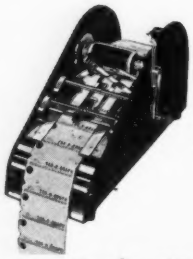
. . . WILL CUT 90% FROM YOUR TAGGING AND LABELING EXPENSE

. . . WILL DO IT FASTER, CHEAPER AND, MOST IMPORTANT, WITH PERFECT ACCURACY

Here is the ideal equipment to address tags, labels, cartons many times more legibly and at a fraction of the time it takes to do it by hand. Prevents errors in shipping. Inexpensive.

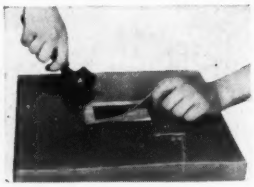


The WEBER Tag Addressing Machine. Standard since 1903. Hundreds of original models still giving good service. Addresses No. 5 shipping tags and labels at speed of 250 a minute. Operates fast as a typewriter. 4 line capacity. Gothic type. Price $550.00 FOB Mt. Prospect, Ill.



The WEBER Model R Tag-O-Graph. Prints addresses on tags and labels at speed of 150 a minute by means of inexpensive stencil 3¼" x 1¾". May be handwritten or typed. A single stencil costs only 2½c yet will give 2000 prints. 9 line capacity. Price $190.00 FOB Mt. Prospect, Ill.

The WEBER Tag-O-Graph Jr. A speedy hand imprinting device. Stencils clamp in place. Sharp, clear, prints size 3¼" x 1¾". Capacity 9 lines. Over 18,000 in use. Shipping weight 2 lbs. Sent anywhere on 10 days FREE TRIAL. Price complete with 25 extra stencils, ink, styli, hand writing board and instructions $7.50 plus parcel post. (Also available in post card size for $15.00.)



The WEBER H-3 Tag-O-Graph. Recommended for printing on boxes, cartons and uneven, hard to get at surfaces. Inked roller rolls across stencil. Speedy. Neat. 10 days FREE TRIAL. Price complete with 25 extra stencils, ink, hand writing board, styli and instructions $11.50 plus parcel post. (Also available in post card size for $15.00.)

Send for full information on any of the models listed above or tell us your individual requirements.

THE WEBER ADDRESSING MACHINE CO.

200 WEST CENTRAL RD. MOUNT PROSPECT, ILL.

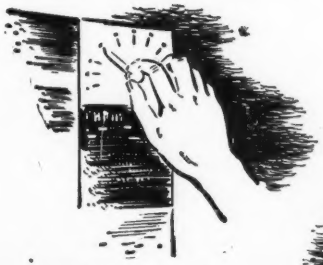
Largest Exclusive Tag and Label Addressing Machine Manufacturers in the World

get 'em and forget 'em

BATTERY CHARGERS

G-E motor-driven battery chargers used for single-circuit equipment.

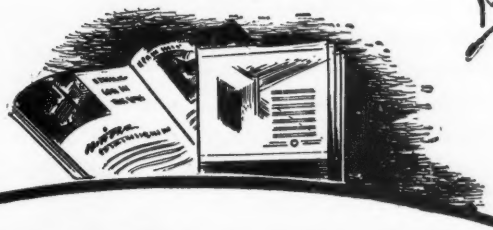
Standard, sturdy, G-E motor-driven battery chargers can now be ordered through your truck dealer: easily installed, automatically operated, and rapidly serviced. Good for years of trouble-free service in most cases, you can get 'em and forget 'em. For any industrial truck battery, for any number of batteries, there's a motor-driven charger. Ask your truck manufacturer for the new G-E charger bulletin, GEA-3923B or write the *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



EASY TO OPERATE Fully automatic from start to finish, protected against dirt and damage, compact, designed and manufactured for long life, G-E chargers meet E.I.T.A. Standard Specifications. Regardless of size, these chargers are economical to operate, supplying exactly the voltage and charging current required by each battery.

EASY TO SERVICE Should a charger need servicing, a phone call to the nearest G-E office will bring experienced help quickly. This prompt service avoids long delays in moving material. The G-E service shops are set up to handle all types of work on electrical equipment, and you can be sure of equipment as good as new when these services are used.

EASY TO ORDER Available only through truck manufacturers, this arrangement means you can get the most suitable charging equipment for your trucks, because the truck manufacturer helps you select it. You can also be sure of prompt delivery from stock. When it's G.E. we believe it's the best in design, materials, and workmanship.



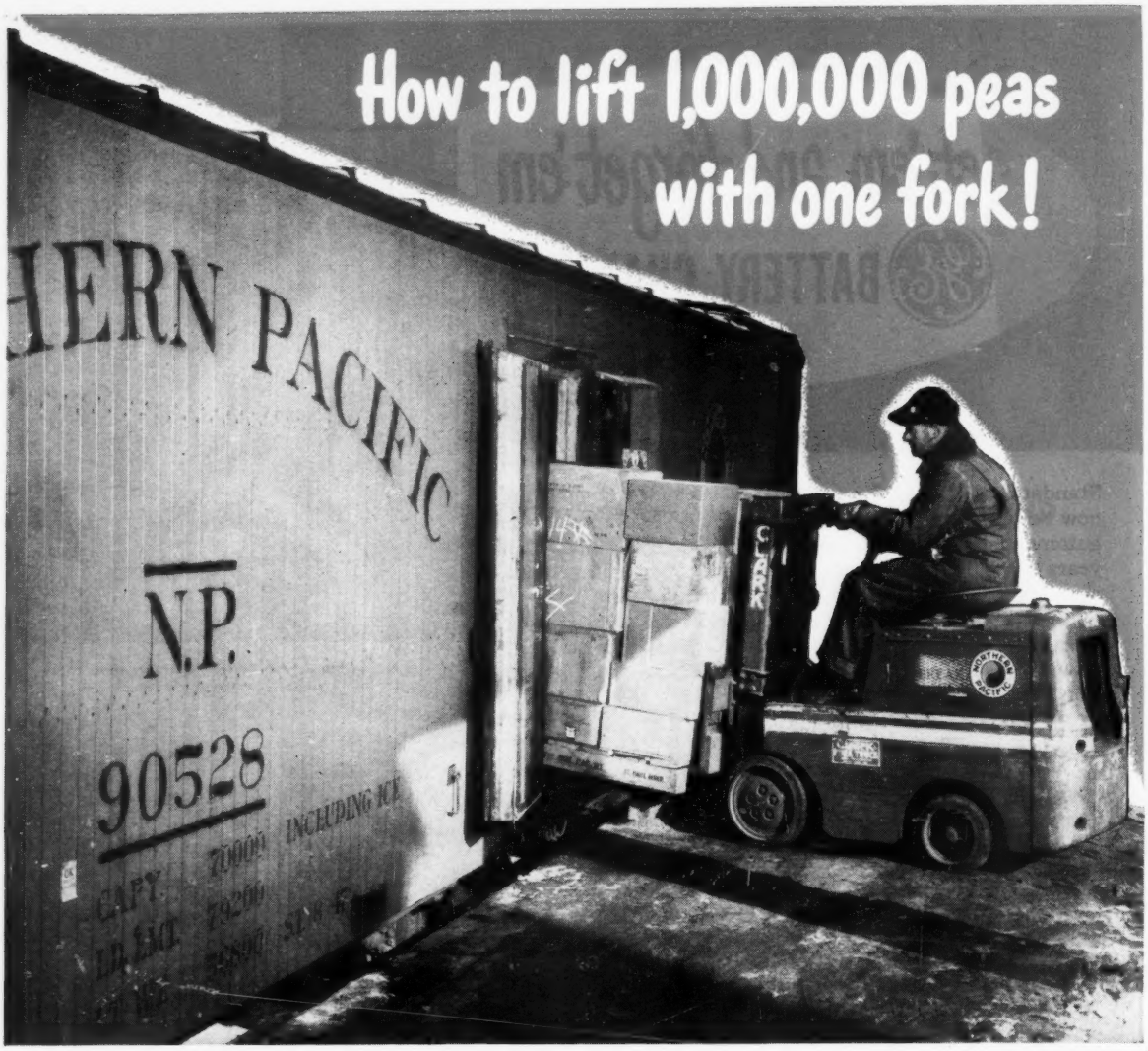
NEW BATTERY-CHARGING EQUIPMENT AVAILABLE THROUGH YOUR

KEEP EM ROLLING WITH G-E CHARGERS

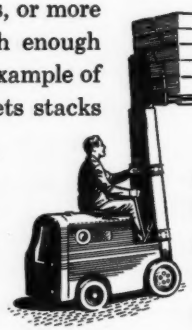
Truck Dealer

GENERAL ELECTRIC

760-5



HE DOES IT without spilling a single one . . . thanks to this new **Northern Pacific** "fork" or "fork lift." It easily hoists 30 cases, or more than 1,000,000 individual peas, high enough to walk underneath. This is just an example of what this mighty mite can do. It sets stacks of crates atop other stacks in boxcar, truck or warehouse . . . and backs surefootedly away. It turns in a 10-foot circle, and cruises at 8 miles per hour!



To shippers, the new fork lifts, electrically operated lift trucks and motor powered trucks that N.P. is using at principal stations all along the *Main Street of the Northwest* mean faster freight handling and reduced damage to merchandise.

And teaming up with these new machines that clip precious minutes off freight handling time are **Northern Pacific's** new 6,000-horsepower diesels that speed freight to destinations. Call on us when we can give you a lift!

NORTHERN PACIFIC RAILWAY
Main Street of the Northwest

MATERIAL HANDLING News

Electric Fork Trucks and Gas Fork Trucks ...CLARK BUILDS BOTH

It is as true in the field of materials handling as it is in the field of medicine that a completely objective and unbiased approach is essential to any search for facts.

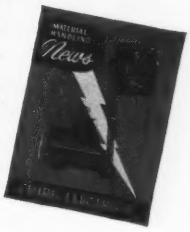
This truth places Clark field engineers in an enviable if not unique position in surveying to determine materials handling needs, because *Clark manufactures both* gas-powered and electric battery-powered machines. Having determined all basic requirements where fork trucks are concerned, Clark sales engineers are utterly free of limitations in recommending which power type will do the most efficient, most economical job.

There are many installations in which gas-powered equipment does the best possible job; and Clark gas-powered machines do these "best possible" jobs in the best possible manner. Many gas-powered Clark machines remain in operation after years of continuous service—ample proof of their sturdy excellence.

There are also many installations in which it is clear that electric battery-powered machines will serve most efficiently and economically—and in these instances Clark sales engineers recommend Clark electrics, again to do the "best possible" job in the best possible manner.

Clark undertook the manufacture of electric battery-powered fork trucks with a conviction that it could build a better machine than it could find on the market, and at a lower cost. Exclusive initial economies which Clark foresaw and achieved—and which it affords Clark users—resulted from Clark's mass production of both gas and electric machines as well as of most of their major components, and from its unparalleled pattern of parts interchangeability. These are basic advantages immediately apparent to men who know production.

It must be equally apparent—that whether Clark's recommendation is for gas-powered equipment or for electric battery-powered equipment, it is based on *facts*, and is free of prejudices arising naturally out of a one-line approach.



We believe that it will pay you to CONSULT CLARK.

Write for and read the story in the current Material Handling News.

Some of the best ads for CLARK fork trucks are written by their users...

Advertisement on opposite page reprinted by permission of Northern Pacific Railway

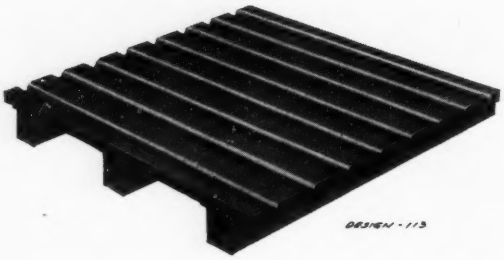
CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

CLARK EQUIPMENT COMPANY, TRUCTRACTOR DIVISION, BATTLE CREEK 13, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

POWELL PALLETS

Patent Nos. 2148150 - - 2152086

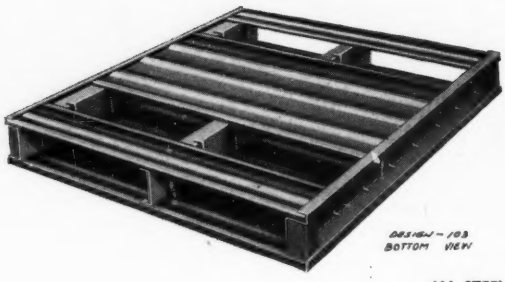
ALL STEEL OR WOOD-STEEL ASSEMBLIES SPECIFICALLY ENGINEERED TO MEET YOUR INDIVIDUAL REQUIREMENT



ALL STEEL

ALL STEEL

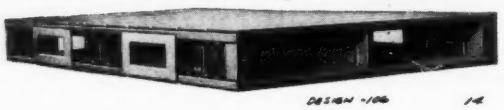
ALL STEEL



ALL STEEL

CAN BE FURNISHED WITH EITHER SLATTED OR SOLID DECKS AND IN EITHER SINGLE OR REVERSIBLE DESIGN

Designs for 4-Way Truck Handling Also Available



WOOD STEEL

ALL STEEL

These standard designs also permit use of auxiliary equipment as stacking shop boxes—stakes and pockets—crane lugs—adaption of caster for live mobility.

Representation in Principal Cities

THE POWELL PRESSED STEEL CO.—HUBBARD, OHIO

"ORIGINATORS of Cold Formed All Steel Handling Equipment"

HOISTING! LOADING!

You can do them CHEAPER-BETTER

IT'S ALL HERE in the Roebling Sling Data Book . . . everything you want to know about slings to handle loads quickly, safely and economically.

★ **Seventy pages of facts about hoisting and loading:**

★ **Details about the design, construction and use of wire rope slings and sling accessories, described in words and drawings:**

★ **Photographs illustrating types of slings and accessories and showing typical hoisting operations:**

★ **Diagrams and tables that get down to brass tacks on necessary technical data:**

★ **Illustrated instructions for ordering wire rope and fittings assemblies.**

Whether you handle small simple loads or the largest, most expensive equipment, the *right* slings, *used* right, can help you improve and speed up operations all along the line.

Write today for your free copy of this easy-to-use, practical book. It may help you as it has helped others from coast to coast to win new efficiency at new low cost. Write for booklet A-900, or simply fill in and mail the coupon below.

SEND FOR THIS SLING BOOKLET FREE

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
Branches and Warehouses in Principal Cities

ROEBLING

A CENTURY OF CONFIDENCE

★ *WIRE ROPE AND STRAND* ★ *FITTINGS* ★ *SLINGS* ★ *SUSPENSION BRIDGES AND CABLES* ★ *AIRCORD, AIRCORD TERMINALS AND AIR CONTROLS* ★ *AERIAL WIRE ROPE SYSTEMS* ★ *ELECTRICAL WIRE AND CABLE* ★ *SKI LIFTS* ★ *HARD, ANNEALED OR TEMPERED HIGH AND LOW CARBON FINE AND SPECIALTY WIRE, FLAT WIRE, COLD ROLLED STRIP AND COLD ROLLED SPRING STEEL* ★ *SCREEN, HARDWARE AND INDUSTRIAL WIRE CLOTH* ★ *LAWN MOWERS*

John A. Roebling's Sons Company
Dept. 327, Trenton 2, New Jersey

Gentlemen: Please send my free copy of the Roebling Sling Data Book.

Name_____

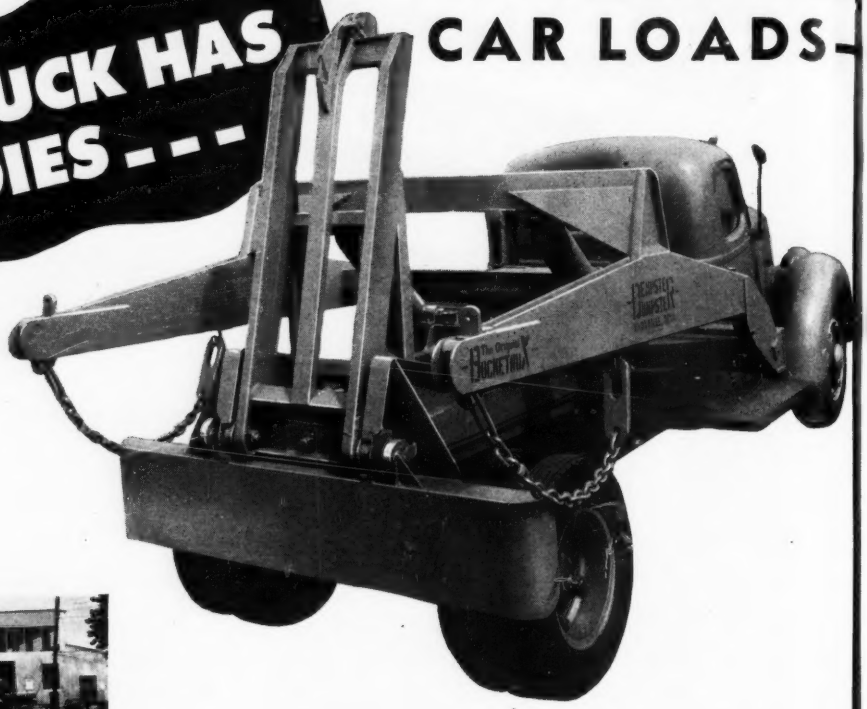
Title_____

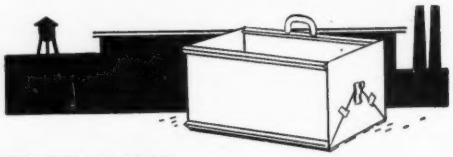
Company_____

Address_____

THIS TRUCK HAS 37 BODIES - - -

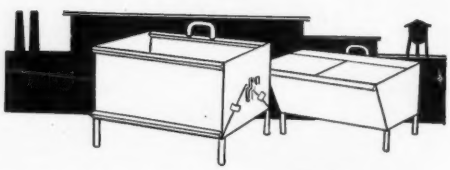
. . . HANDLES 22 CAR LOADS-OI





FELT MILL DIVISION

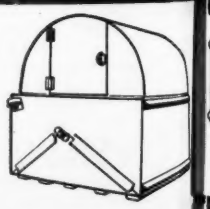
Produces 30 cu. yds. of scrap and clean-up per day. Two, 6 cu. yds. Heavy Duty Drop Bottom Bodies are used.



ROOFING MILL AND MACHINE DIVISION

Produces 104-1/2 cu. yds. of tabs, shingle scrap, slate scrap and roofing scrap per day. Seventeen, 5 cu. yds. Drop Bottom Bodies on legs and two, 2 cu. yds. Water-Tight Tilt Type Bodies on legs are used.

Shown at right are 4 standard types of Dempster-Dumpster bodies. Many variations are available to make these bodies meet every materials handling requirement. Sizes range from 1-1/2 to 20 cu. yds. capacities. A Dempster-Dumpster engineering survey, without obligation to you, will doubtless show tremendous savings for your plant. Write or wire us now.



220 CUBIC YARDS—4 RAILROAD CARS—OF WASTE AND SCRAP DAILY—

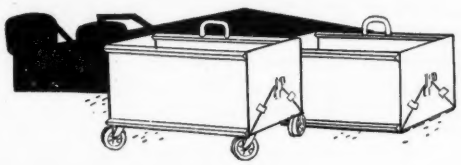
HERE IS A TYPICAL EXAMPLE OF LOW COST DEMPSTER-DUMPSTER MATERIALS HANDLING IN INDUSTRIAL PLANTS. IN THIS CASE, IN A LARGE ROOFING PLANT.

In one of the nation's largest roofing plants, collection and removal of waste and scrap had developed into an expensive problem, Approximately 220 cu. yds. —about 4 railroad car loads—of every type of waste . . . heavy, light, bulky, moist and dry, had to be collected daily from many points in this widespread plant . . . some in driblets, some in large volume.

A more flexible, less expensive system of collection was vital.

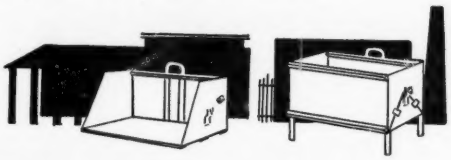
A Dempster Engineering Survey showed how one Dempster-Dumpster Hoisting Unit on truck, serving 37 detachable bodies of various types could collect and dump the plant's entire daily scrap output in only eight hours. As a result of this comprehensive survey, Dempster-Dumpster system was put to work. Spotting the bodies at predetermined accumulation points throughout the plant, the truck hoisting unit and one man, the driver, hydraulically pick up each body as it is filled . . . haul it . . . dump it and return it for reloading (as illustrated at extreme left). The different types of bodies were ordered for most effective materials handled . . . heavy duty bodies for heavy slate scrap . . . light bodies for light bulky felt scrap. Bodies on casters, pushed right up to the machine to receive scrap, eliminated wheelbarrow and hand carrying. At another point bodies are carried in and out of the building by the plant's power driven platform-lift trucks. Scrap collection in this plant is now made on an efficient time-table basis. Savings, over the original cost of handling waste and scrap, have paid for the entire installation in almost 12 months. In many other installations in less time.

Here is how the Dempster-Dumpster System serves all plant sections simultaneously. Replacing an obsolete system of truck-drawn hard wheel trailers, clumsy bins, wheelbarrow handling and hours of useless clean-up time, this installation comprises one truck hoisting unit and 37 bodies in 7 different types. Bodies receive the scrap as it accumulates. When a body is filled, it is picked up by the truck hoisting unit, carried to the disposal area, dumped and returned for refilling. Seven main plant sections are served by the truck hoisting unit, as shown below. Amount of scrap produced and body used is also shown.



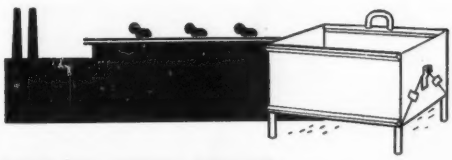
HYDRO-PULPER DIVISION

Produces 28 cu. yds. of scrap per day. One, 6 cu. yds. Heavy Duty Drop Bottom Body and four, 6 cu. yds. Drop Bottom Bodies on casters are used.



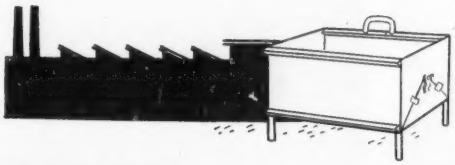
LOADING DOCK AND POWER HOUSE

Produce varying amounts of waste, debris and waste coating in drums. For loading Dock, one 2-1/2 cu. yds. Skip Type Body. For Power House, one, 2-1/2 cu. yds. Drop Bottom Body on legs are used.



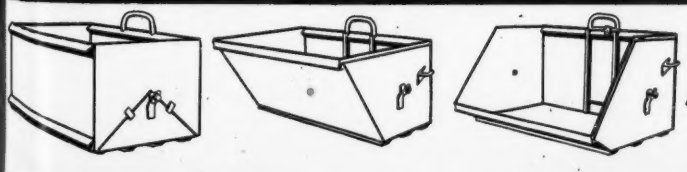
PRESS AND CUTTING DIVISION

Produces 24-1/2 cu. yds. of roofing scrap and cuttings per day. Five, 5 cu. yds. Drop Bottom Bodies on legs are used.



DIE CUTTING PLANT

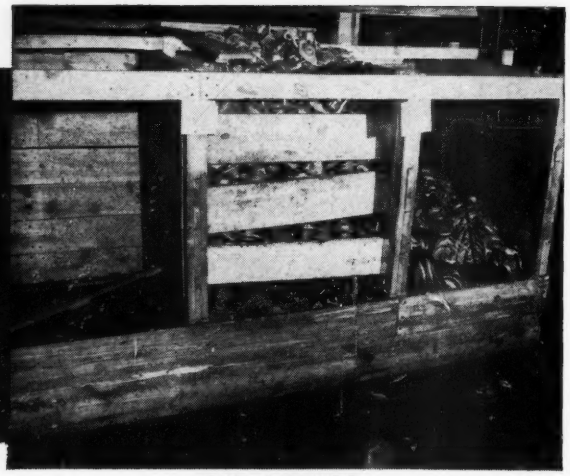
Produces 30 cu. yds. of scrap per day. Four, 4 cu. yds. special duty Drop Bottom Bodies on legs are used.



DEMPSTER DUMPSTER TRADE MARK REG. SYSTEM

DEMPSTER BROTHERS INC., 868 NORTH KNOX, KNOXVILLE, TENNESSEE

Pittsburgh Cargotainers save $35. per carload handling castings at Westinghouse



OLD METHOD

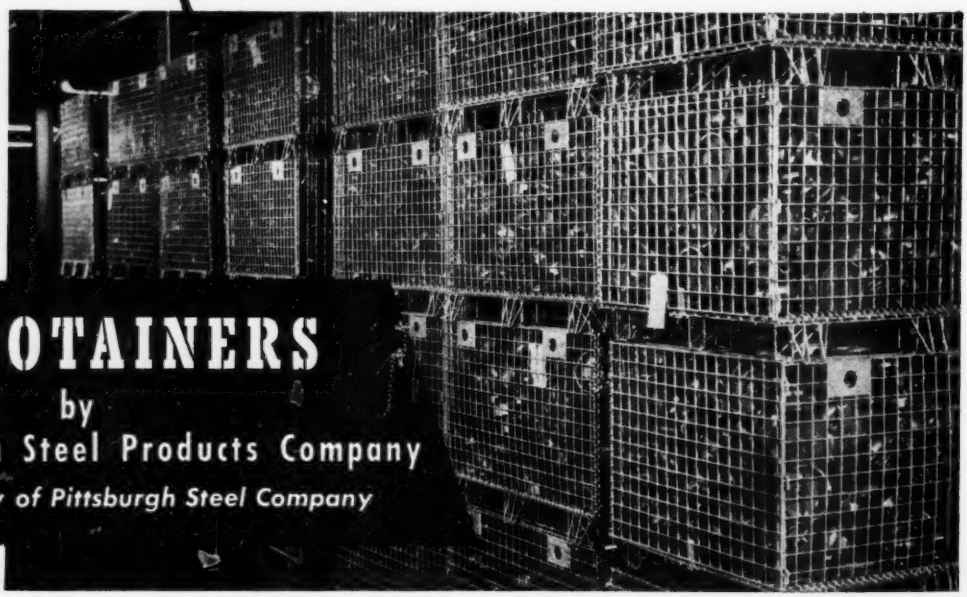
You can save with Cargotainers just as Westinghouse is doing at its Small Motors Division, Lima, Ohio. Formerly, bracket castings were unloaded by hand from railroad freight cars into skidboxes. These were carried to the storeroom by electric truck and unloaded by hand into wooden bins. This took one man 48 hours—it cost $41.00.*

Now the castings are received in collapsible wire Cargotainers. The same electric truck picks up the containers of castings from the freight car and unloads it in only 3½ hours at a cost of merely $6.00—a net savings of $35 per carload. In addition Pittsburgh Cargotainers have made possible several other savings—the old wooden bins are out and castings are now kept in Cargotainers tiered four-high until used—a big savings in floor space. Breakage in the Westinghouse plant has been eliminated as has the demurrage on freight cars. Better inventory and accounting is possible. Work is scheduled without delay. These are all extra savings not included in the $35 saved on handling alone.

If you want to save money on your materials handling, it will pay you to investigate Pittsburgh Cargotainers. Write to Pittsburgh Steel Products Company, 3255 Grant Building, Pittsburgh 30, Pa. for information.

**From "Better Handling Nets Important Savings" Factory Management & Maintenance, February 1948.*

MODERN CARGOTAINER METHOD



CARGOTAINERS

by

Pittsburgh Steel Products Company

Subsidiary of Pittsburgh Steel Company

How continuously it works is what counts

Illustrated here is a handling operation which is typical of the work some trucks perform throughout every shift . . . 24 hours a day! Under such circumstances every delay for servicing or repairs means lost time, lost income.

★

The logical truck for such work is an electric truck. Its motor drive stays on the job because it has few wearing parts . . . *only one basic moving part.*

The logical battery to power the truck is an EDISON Nickel-Iron-Alkaline Battery. With steel cell construction inside and out, an electrolyte that is a preservative of steel, and a foolproof electrochemical principle of action, EDISON Batteries are the longest-lived, most durable and most trouble-free of all.

★

For long years of dependable service, equip your trucks with EDISON Batteries. *They're built stronger and last longer!*

EDISON

Nickel • Iron • Alkaline

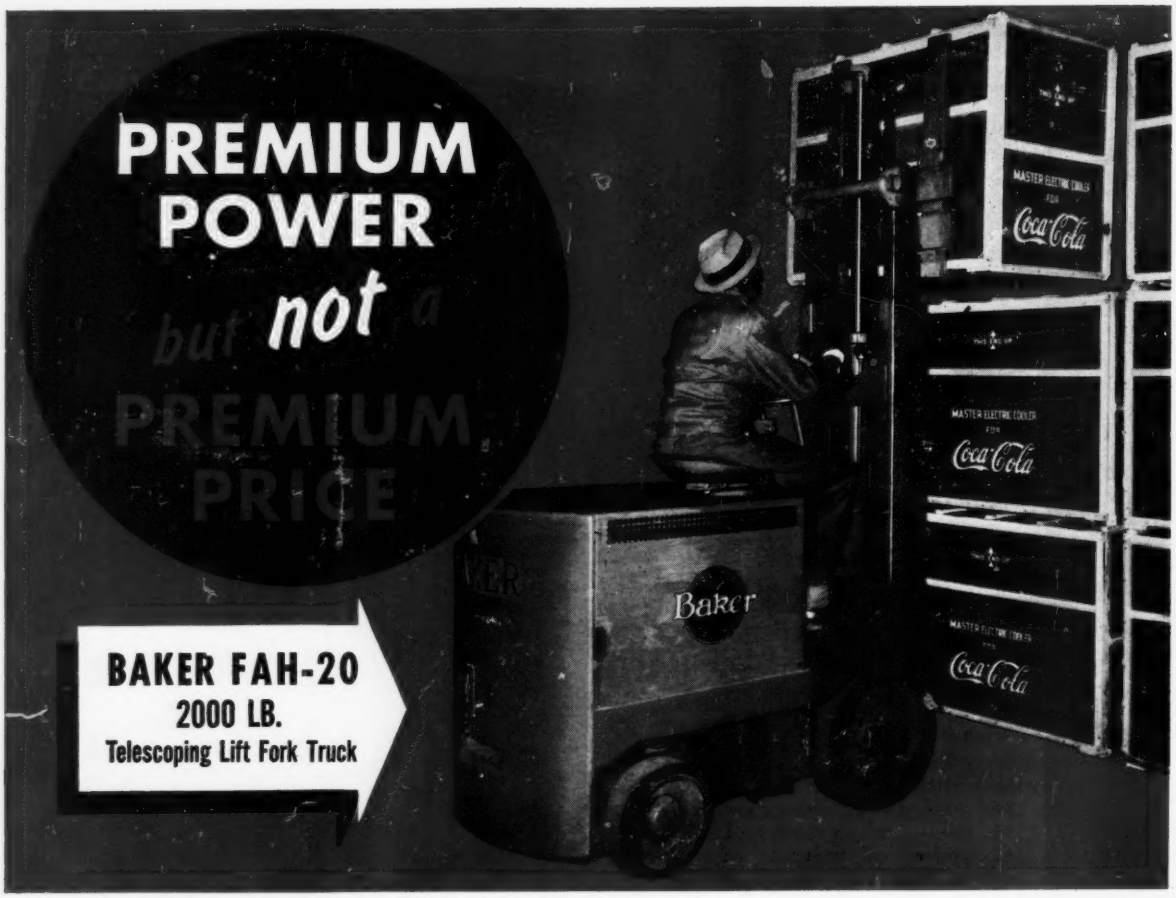
STORAGE BATTERIES

ADVANTAGES OF EDISON NICKEL-IRON-ALKALINE BATTERIES:

They are durable mechanically; can be charged rapidly; withstand temperature extremes; are foolproof electrically; can stand idle indefinitely without injury; are simple and easy to maintain.

EDISON STORAGE BATTERY DIVISION OF THOMAS A. EDISON, INCORPORATED, WEST ORANGE, N. J.

In Canada: International Equipment Company, Ltd., Montreal and Toronto



SPECIFY **Aircool BATTERIES**

C & D "SIXTY"

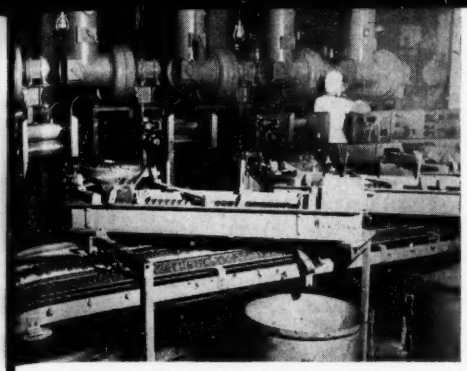
with

INSULATION **FOURFOLD** RETENTION

1. Vertical Fibre Glass Retainer
2. Horizontal Fibre Glass Retainer
3. Perforated Hard Rubber Retainer
4. Microporous Rubber Separator

C & D Batteries Inc., Conshohocken, Pa.—*Building Better Batteries for more than 40 years*

HEAVY DUTY BATTERIES FOR ELECTRIC INDUSTRIAL TRUCKS • ELECTRIC LOCOMOTIVES • DIESEL LOCOMOTIVES
AIR CONDITIONING AND CAR LIGHTING • TELEPHONE • MARINE • AUXILIARY POWER
STARTING AND LIGHTING BATTERIES FOR MOTORCYCLES • AUTOMOBILES • TRUCKS • BUSES • INDUSTRIAL EQUIPMENT



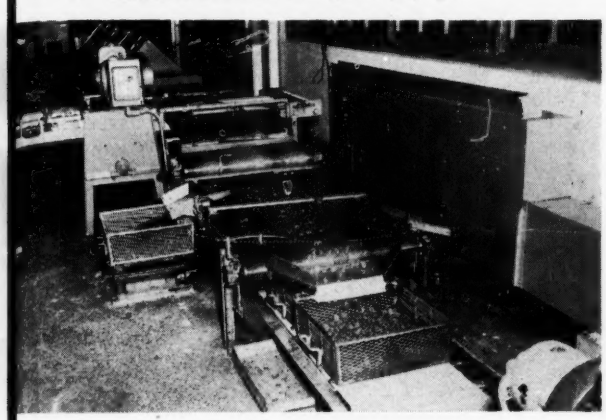
FROM PRODUCTION TO SORTING. Wire mesh belts delivering candy drops from forming machines to lateral take-away conveyor, via sorters, foreground.

Wire Mesh Belt Conveyors, Wire Mesh Baskets, Belt, Chain, and Gravity, Roller Conveyors, Castered Dollies

MECHANICAL HANDLING—

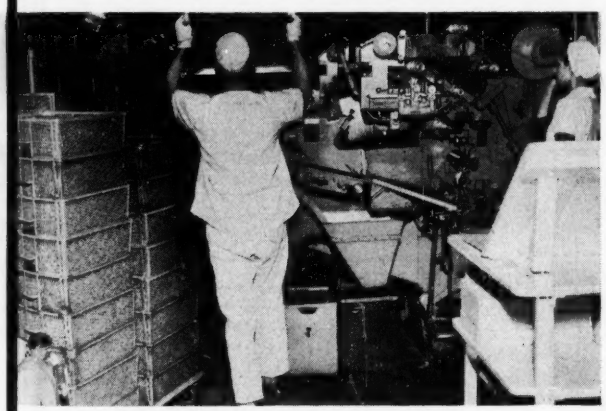
Life Saver

Hundreds of millions of candy drops travel through processing and packaging—on four floor levels—without being touched by hand. Mechanical devices make for "palatable" handling and an efficient material flow at Life Savers Corp.

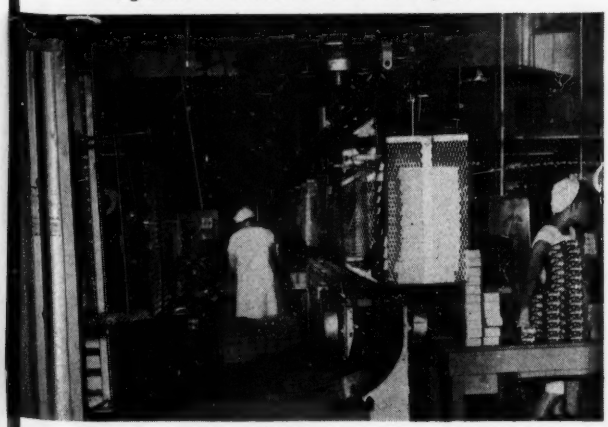


COOLING LIFE SAVERS. Lateral line, rear, delivers to wire mesh cooling conveyor, right.

TO PACKAGING. Without being touched by hand, candies are now discharged to hoppers.



SPACE UTILIZED. Conveyors divide packaging stations. Overhead line feeds empties.



AMERICANS are large-scale consumers of candy drops and mints. The Life Savers Corp., Port Chester, N. Y., one of the country's principal manufacturers of this product, turns out hundreds of millions of packages of this five-cent candy annually. It makes both a pressed mint and a cooked hard candy type. The flow of the latter is covered in this description.

After cooking in copper kettles has transformed the syrup into a thick mass, it is emptied into pans for transfer on castered dollies to the batch mixers, where the flavoring is added. These mixers apply a mechanical kneading action in distributing the flavor evenly through each 160-pound batch. The original 212-degree temperature of the material drops slowly and the candy gradually changes into a taffy-like mass. All but one percent (or less) of the moisture has been previously cooked out of it.

Travel, Cooling on Wire Mesh Belts

After mixing, the batch is cut into three equal parts for easy subsequent handling, and the individual parts are then placed through wall openings into the adjoining tablet-making ("spinning") room, which is air conditioned. This is on the fifth floor of the building where all manufacturing of hard candy takes place. In the normal course of the flow the packaged product is delivered to the first-floor packing and shipping department.

The individual batches weighing more than 50 pounds are placed on the batch rolls of the tablet-making machines. The material is then drawn out into a ribbon that is fed into the machine. The battery of the machines is lined up on the north side of the 60′ x 80′ room, where packaging is done in the south portion. The output of a tablet forming machine of the latest type is in excess of 200,000 tablets per hour. From this an idea can be gained of the many millions of small pieces that flow through the

room—without being touched by hand.

The tablets coming out of each machine are discharged on a 12-inch, triple-deck wire mesh belt. The temperature of the candy is still about 165 degrees and it must be cooled before delivery to the high-capacity packaging machines on the opposite side of the room. For this purpose, a sheet metal hood is built over the line and cool air is blown into the enclosure. The air is distributed through the wire mesh of the carrying surface, through all three strands of the belt. Thus the cool metal surface itself serves to facilitate the cooling of the candy.

The triple-deck belt serving each machine has a total travel distance of 65 feet. This exposes the tablets for several minutes to the cool air being blown into the hood. From the lowest deck the candy is then discharged over a metal chute into the sorter at the end of each wire mesh line. Each sorter consists of two rollers with spiral grooves turning toward a bar set in the center. The sorting (for size) is done by varying spaces between the center bar and the rolls. The tablets that are too small drop through a gap first and are discharged through a metal chute to a bucket on the left side of another wire mesh belt conveyor, 30" x 50', that travels in a lateral direction to the tablet forming machines. It carries away the total output from the entire battery.

The tablets of the regular size drop through the center of the sorter onto the belt below. Tablets that are too large (usually because of air bubbles) are discharged into a container at the right side of the wire mesh belt. The candy thus sorted "out"—each tablet must be of the correct size for the packaging machines—is later reprocessed by melting and filtering.

The total production from all the machines is carried by the lateral wire mesh belt to the east side of the room, where deflector arms shunt the traveling material onto a cooling conveyor, also a wire mesh belt type, 50 feet long and running north. This double-deck conveyor provides a total travel distance of 100 feet, and is likewise covered with a hood serving for a cool air tunnel. At the end point of this line the hard candy tablets are sufficiently cool to be transferred to the packaging machines.

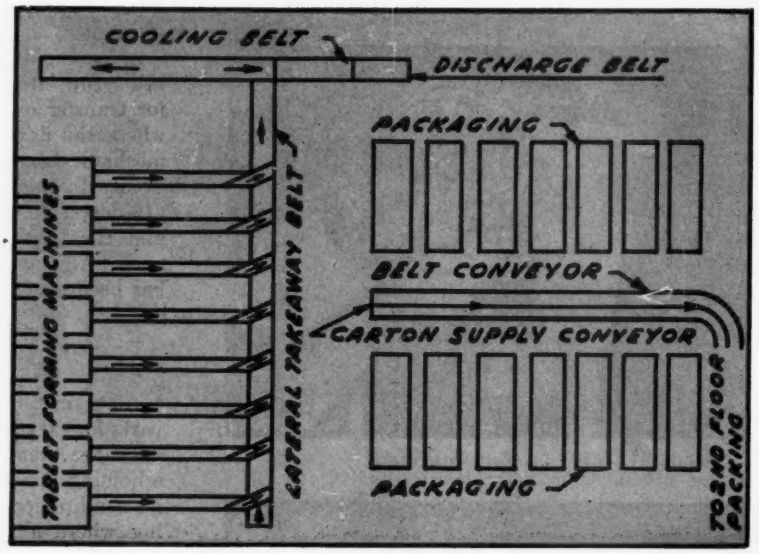
Clever Discharging Method

An efficient arrangement is used at the end of this line for transferring the candy into wire baskets without the need of manipulating it manually. About eight inches below the discharge end of the cooling conveyor an 18" x 10' canvas belt line operates. About half of its length is under the wire mesh line, the second half to the front of it. The wire baskets that receive the candy (17" x 17" x 6½") are set side to side on the lower belt, which runs in the same direction as the upper conveyor. The lower canvas belt travels about six feet per minute, the purpose of the slow pace being to fill a basket completely (at normal production) by the time it has traveled the distance of its width (17") under the spout extending down from the cooling conveyor. The operator at this station merely keeps the lower canvas belt line filled with empty wire baskets. At the start of the day's run, when the upper belt is not fully loaded yet, the operator may have to return a basket for a full load of 45 pounds, but at normal production the baskets are properly filled at one pass.

The Life Savers in this room are made in a variety of flavors. With some of the tablet forming machines turning out several flavors at the same time, the products must be kept separate. This is accomplished by guide rails on the lateral "take away" belt and on the north-south cooling conveyor. The guide rails create several lanes on the wire mesh carrying surfaces, and each flavor is shunted on its particular lane. From the lateral conveyor the pieces are discharged on the comparable lanes on the north-south line. From the end point of the latter the tablets of different flavors can be shunted by means of deflector arms into containers to either side of the conveyor. The bulk of the run, however, is carried on the center lane into the baskets positioned on the slow-paced lower canvas belt.

After weighing—the electric print weight scale is adjusted to compensate for the weight of the metal baskets—the full baskets are stacked in two tiers of eight units each on a castered dolly. The weight slip is placed in each basket. The operator then pushes the loaded dolly to the batteries of adjacent packaging machines, where the baskets are emptied into the machine hoppers. The operator of each machine is given the weight slip as each basket is dumped. At the end of the shift the packaging machine operator turns in her weight slips to receive credit for her total production.

(Turn to page 67)

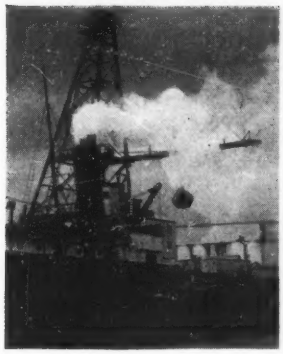


THE LAYOUT. Life Savers on lateral and longitudinal wire mesh conveyors. Compact layout, high production.

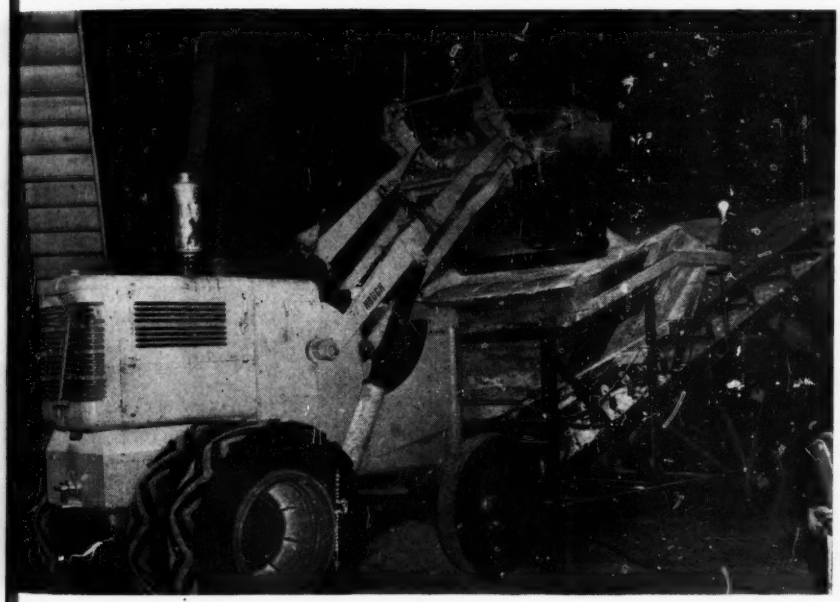
Aiding Chicago's ice clearance problem—

6 Tons of salt in 3 minutes

Other municipalities may profit from Chicago's method of loading a 6-ton delivery truck of rock salt in three minutes. The handling is by the cubic yard instead of by the shovel. (For the benefit of other municipalities, these data are given in plenty of time for next winter.)



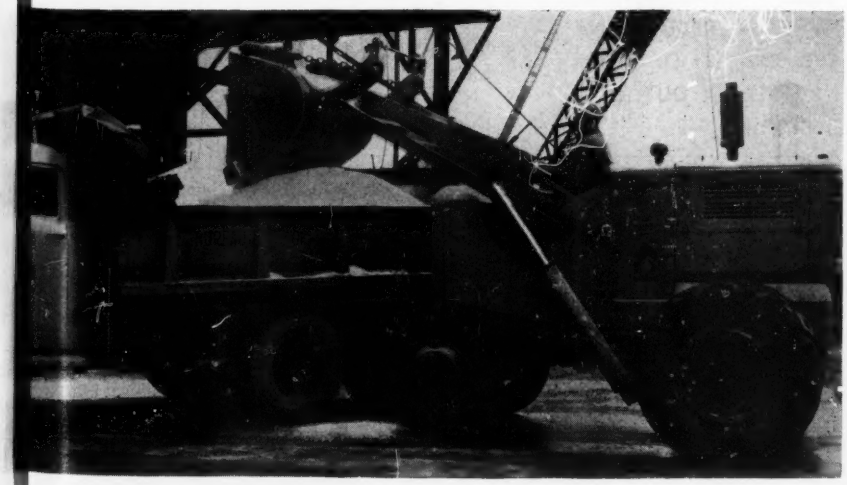
CLAMSHELL unloads the Lake freighter Jupiter, starting salt flow ending in delivery trucks.



BELT CONVEYORS, CLAMSHELL, POWERED SCOOP TRUCKS

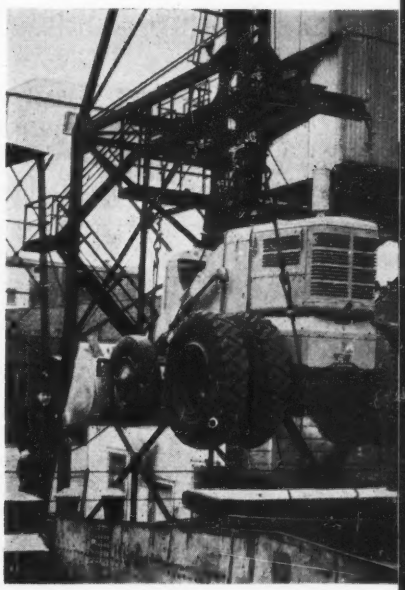
WHEN the weather man blanketed the city of Chicago last winter with ice and snow, the Morton Salt Co. furnished a constant flow of rock salt to the City Street Department for ice clearance of miles of thoroughfares, car lines and cross walks. This midwestern metropolis uses as much as 20,000,000 pounds of rock salt in a single

HYDRAULICALLY OPERATED SCOOP supplies granulated salt to conveyor which feeds the kiln. ▲



▼ ICE CLEARANCE is aided because City trucks are loaded in few minutes by 1. cu. yd. scoops.

SCOOP TRUCK being lowered into hold, where it banks salt from corners for the clamshell.



winter season. The material handling devices on this tremendous project include a crane with a 125-foot boom and clamshell, a belt conveyor system more than 1000 feet long and a fleet of scoop trucks. The latter figures prominently in the actual distribution of the salt.

The bulk rock salt arrives from mines near Detroit on the 5500-ton freighter Jupiter. The clamshell unloads the ship, discharging the individual loads in a hopper that feeds a conveyor line. The latter delivers to the main belt running in a housing high above the full length of the bulk house. The arriving salt is discharged through hatches by use of a tripper which rides on tracks to either side of the belt. Upon completion of each huge stockpile, the tripper is moved to start another pile. The warehouse has a capacity of 15,000 tons for rock salt, and there are also bins to accommodate about 18,000 tons of airdried granulated salt. (The latter is delivered to the company's Chicago dock by the same lake freighter from Morton plants in Ohio and Michigan.)

Unloading, and Clearing the Ice

When the ship is nearly unloaded, a scoop truck is lowered into the hold to cooperate with the clamshell operation. The scoop truck maneuvers in the corners of the hold, then banks up the remaining salt in the square of the hatch and thus makes it accessible to the clamshell. Two-inch shoes are fastened on the underside of the truck's one-cubic-yard bucket to keep it from scraping the bottom.

Some rock salt also arrives by freight car. This job is also done mechanically by use of the shovel trucks. One man will unload an average car in one hour, a job for which time had to be figured by the day when manual methods were used.

Here's another operation performed by these trucks. The air-dried granulated salt, mentioned previously, is usually run through a 300-degree dryer, as shown in one of the photos. A conveyor belt then delivers the kiln dried salt to overhead bins which supply the packing machinery on a lower level.

On days when icy storms hit the city, units of the over-the-road truck fleet line up outside the bulk house to receive salt for ice control. Quick loading is essential in order to get the material to locations where traffic may be snarled or endangered by icy glares on streets and walks. The powered trucks with their hydraulically operated shovels charge the big stockpiles in the warehouse, then deliver a cubic yard at a time to the delivery vehicles. The four units of the fleet maintained by the Morton Co. load well over 100 of the city's 6-ton vehicles during concentrated rush periods. With individual runs held to the shortest possible distance, it takes only an average of three minutes to load each truck. Thus, more than 1,200,000 pounds of salt have been loaded in an eight-hour period by these machines.

Thus, in the Chicago operation, the salt is "never touched by hands" — or the hand-wielded shovel. It is not difficult to visualize the delays that would result if any considerable part of this tonnage had to be moved by shovels, to say nothing of the physical strain that would result. This method developed by the Morton Salt Co., has proved successful in ice control of Chicago's widely scattered metropolitan areas. It may well suggest to other municipalities a few ideas on an effective ice clearance program.

FLOW'S SECOND $1500 COST ANALYSIS CONTEST IS NOW OPEN. EIGHT PRIZES ARE OFFERED, AS FOLLOWS:

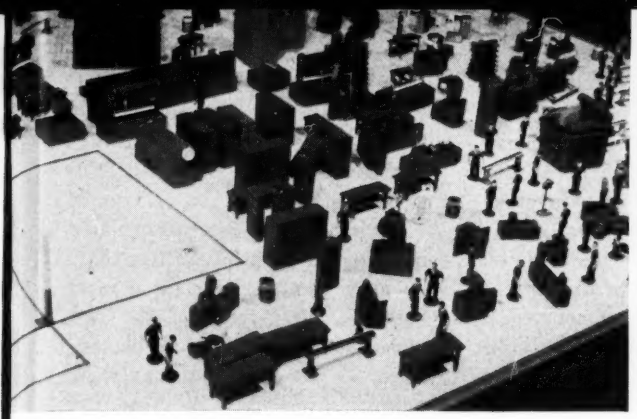
FIRST PRIZE, $500; SECOND PRIZE, $300; THIRD PRIZE, $200; AND FIVE PRIZES OF $100 EACH.

ENTRIES MAY COVER AN ENTIRE PLANT, A DEPARTMENT SUCH AS RECEIVING, PROCESSING, STORAGE, SHIPPING, OR OTHER IN-PLANT AND YARD OPERATIONS.

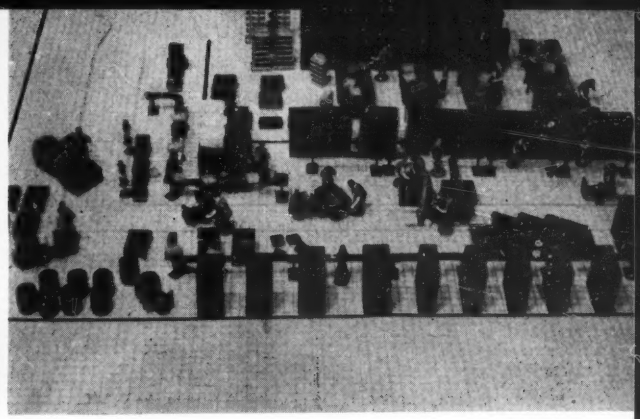
THE PAPERS SUBMITTED MUST COVER ACTUAL OPERATIONS, SHOWING HOW COST REDUCTIONS WERE EFFECTED THRCUGH APPLICATION OF MODERN HANDLING EQUIPMENT, BETTER LAYOUT, ETC. THE CONTEST CLOSES NOVEMBER 15, 1948.

THE RULES ARE SIMPLE. GET AN EARLY START. YOUR PAPER MAY BE A WINNER!

FOR ENTRY BLANKS AND COMPLETE DETAILS, WRITE TO: FLOW, 1240 ONTARIO STREET, CLEVELAND 13, OHIO.



1.



2.

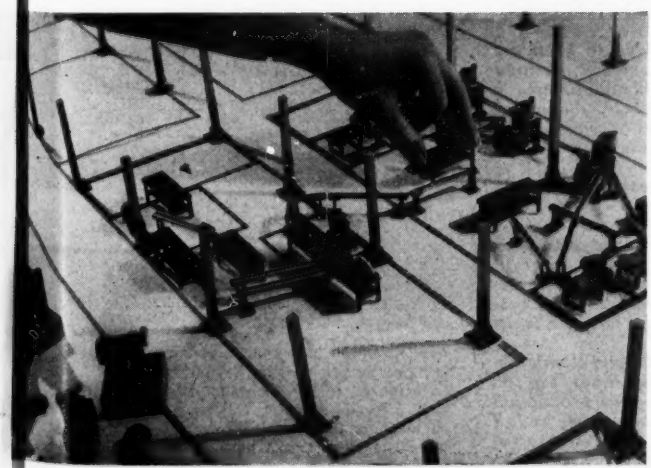
THREE-DIMENSIONAL LAYOUT PLANNING

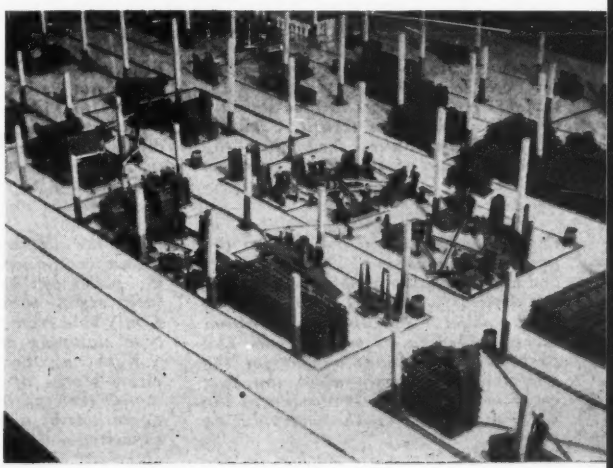
Three-dimensional models—for planning efficient material flow and maximum square-foot productivity. They are a basic planning tool and under changing production requirements.

LAYOUT planning with three-dimensional models has proved itself as a universally understood and exact "language" of planning. It is well known that executives who have difficulty visualizing arrangements from two-dimensional paper templets are readily sold with three-dimensional arrangements using scale models of machines, operators, load carriers and conveying equipment. Such models were used extensively during the recent war, when production lines frequently had to be set up in minimum time. This practice permitted vital changes to be made in the early planning stage, saved time, brought quick agreement among engineers, production losses through later rearrangements.

Three-dimensional layouts leave no doubt in the mind of the observer as to what the plan means. Material flow lines can be laid out accurately within structural confines in relation to: (1) production ma-

3.





4.

HAULING AGGREGATE for concrete in the Fort Gibson Dam on the Grand River in Oklahoma is this 2000-foot conveyor belt. The

belt operates at an angle of 17 degrees and carries aggregate up to six inch mesh at a rate of 308 feet per minute. Thirty inches wide, the Goodrich belting is constructed of five plies of 32-ounce duck.

chine arrangements; (2) work operation sequence; (3) inter-machine or inter-department movement of parts in process; (4) storage facilities and (5) safe procedures.

Figure One shows the required equipment for an operation. This leaves nothing to the memory or to guesswork; the plant and layout engineers have the exact requirements before them. Figures Two and Three illustrate the solutions to sectional or "spot" layout problems. Manipulation of the three-dimensional scale models proves conclusively that things fit or do not fit. Note, for example, the precise arrangement of the machines, work benches and conveyor lines in Figure Three. Figure Four presents the complete plant layout as proposed—the concrete result, readily grasped, of group analysis and group decision.

The importance of accurate planning is pointed up by the fact that machines comprise, except in rare instances, 20 percent of the occupied floor space in many plants; about 80 per cent of the average manufacturing plant is taken up with storage, traffic, material handling and related functions. Three-dimensional models, shown in these photos, help solve the problem of reducing unproductive space, and thus to plan efficient material flow for maximum output from available floor areas.

The use of varicolored tapes in connection with three-dimensional layouts permits graphic, color-coded layouts to be made which afford an accurate comprehension of the space. The inclusion of structural building features (see Figures Three and Four) fixes structural interference factors, thus avoiding costly errors.

Many manufacturers are faced with frequently changing production requirements, based on change of design or change in the type of unit manufactured. Thus three-dimensional models also serve as a permanent tool, ready to provide solutions to changing production requirements.

SPECIAL HOOK-ON DEVICE LICKS HANDLING PROBLEM

HEAVY, irregularly-shaped sprocket gear covers are efficiently, safely and economically handled with specially devised pallets at International Harvester Co.

The company was faced with moving the 350-pound covers from operation to operation by electric powered bridge cranes. Various types of rigs were tried but each proved unsuccessful because the lack of adequate flat surfaces on the covers to give stability to multiple loads in transit. Transfer of individual units, far below the rated capacity of the crane, was uneconomical. Use of rope slings presented a hazard to employee safety.

The two-piece grab, developed in the plant, brought a solution to the problem. It consists of a bottom pallet and a combination hooking and clamping device.

The pallet has a U-bolt and position block welded to its top surface. The position block makes it easy for the operator to correctly place the first cover on the pallet. It also keeps the cover in position on the pallet during transit.

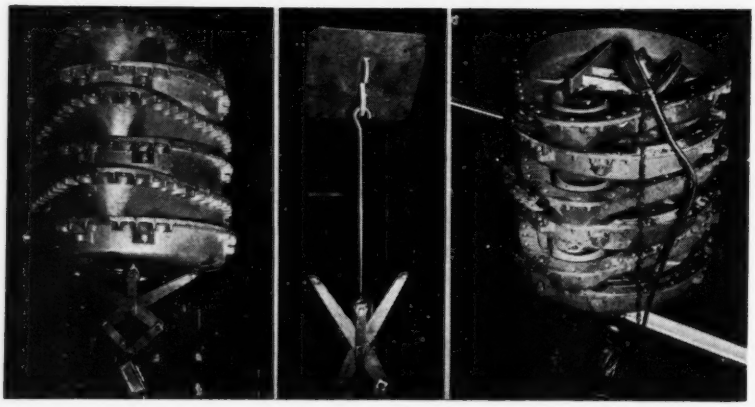
After six covers are stacked on the pallet, utilizing the 2000-pound capacity of the bridge crane, the hook and clamp device is lowered through the drive shaft openings in the covers. The hook end is engaged in the U-bolt of the pallet.

Raising action by the crane causes scissor-like clamping arms at the top of the grab to firmly depress and hold the castings in place during the transfer. A spring is provided to keep the clamping arms in a spread position when not in use. This eliminates a hazard to the operator by making it unnecessary for him to spread the arms while the hooking operation is performed.

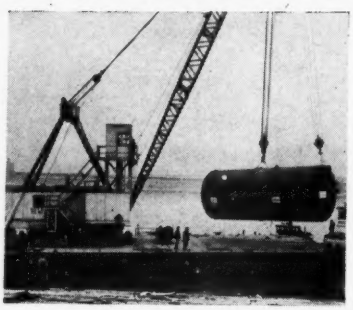
Unhooked at the next machine, the load remains on the pallet until processed.

In the illustration, the device is shown in the center picture. At left, the pallet can be seen while the picture, right, shows how the load is firmly held from the top by the scissor-type clamping arms.

With only two hook-and-clamp devices, scores of pallet loads can be moved through the various production operations by a crane operating at full capacity. — Courtesy, International Harvester Co., Tractor Works.



FLOATING CRANE SERVES AS BRIDGE. When John Nooter Boiler Works Co., St. Louis, completed a water processing tank for Monsanto Chemical Co., at Monsanto, Ill., officials learned a bridge across the Missis-



sippi River had been remodeled and afforded less clearance than when the tank was started. In order to deliver the tank, 50 feet long and 16 feet in diameter, a floating crane was obtained for the Corps of Engineers to carry the 30-ton load to the Illinois side.

Only GOULD Has It!

The Spectrograph—another Gould battery research "exclusive". It detects alloy impurities in quantities as little as one ten-thousandth of one percent.

A complete research laboratory with pilot manufacturing plant where advance-design batteries are constantly created—and proved before production.

Gould battery plates give you extra months of service because they are entirely free from impurities. The Spectrograph, never before employed in battery-making, is one of many research instruments used by Gould to scientifically draw exacting specifications for raw materials. It reveals in minutes, rather than weeks, the slightest trace of impurity that might cut down battery life. One more reason why you get top performance and longer, trouble-free service from GOULD—

FOR FIFTY YEARS THE CHOICE OF ENGINEERS.

The Gould "Thirty"—America's Finest Industrial Truck Battery!

GOULD

STORAGE BATTERY CORPORATION

Including the Storage Battery Division of Philco Corporation

TRENTON 7, NEW JERSEY

Always Use Gould Automobile and Truck Batteries

Records — Blueprints FOR PRODUCTION

Vertical Filing system used for machine loading as described in the article.

1. Records make it possible to keep materials in balance with demand. 2. Over-stocking is eliminated when consumption standards are determined through adequate records. 3. Purchasing department routines are performed in less time with day-to-day knowledge of production requirements. 4. Orders for materials can be placed in economical quantities and far enough in advance to assure prompt delivery. 5. All machines are productively employed by running economical quantity lots whenever practicable. 6. Proper scheduling makes it possible to run re-work items simultaneously with the next regular run and additional machine set up time is avoided. 7. Shortages are prevented in assembly schedules. 8. Delivery dates are met.

IN AMERICA'S best-managed plants, the material flow through receiving, production, warehousing and shipping is coordinated by means of records so that the greatest output of finished goods is achieved within the least possible time and at lowest cost.

Production and material control consists of issuing work orders and collecting reports. The more economically these are collected, the better is the control. Records should show the material on hand and on order, the amounts of work scheduled, daily performance of men and machines. These facts are assembled in a central place. It is here that the plant's "pulse" is checked to determine the flow of materials through all departments.

Definite standards must be established in setting up a control system. For example, it is important to know how many parts can be made from a piece of material; how long it will take, the cost per part, etc. This information is essential in making contracts, assigning work, meeting delivery promises and determining profit and loss. Standard or special control forms should be provided to compute this data in order to eliminate delay in production start.

"Paper work" can be reduced and simplified by means of proper forms. In this way, uniform records of all activities are maintained and efficient operating controls result. For further simplification of production control, there are several ways of projecting visually the information included in the forms. This eliminates frequent re-shuffling of papers, and production status is obtained at a glance.

These visual graphic devices are kept current with the daily reports from departments which are kept in files of records. The visual devices include charts, pin and peg boards, punch boards, punched cards, squared paper graphs, transparent signals, and others. Production goals are set up according to the established standards and marked on these devices. The ability of processing departments to maintain the established pace can be determined from the daily changes in the chart. For office convenience, these graphic devices are furnished in wall types, desk models, table and cabinet styles according to the space available, the number of items to be recorded or personal preference of the user.

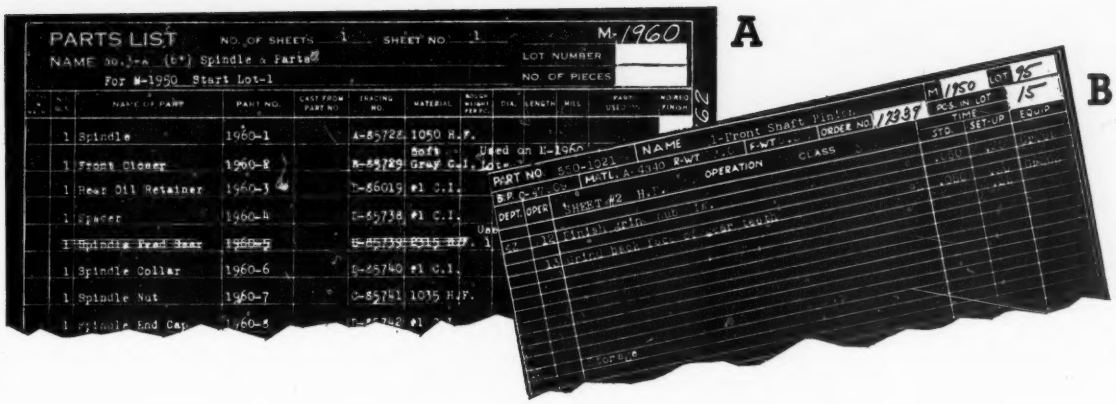
Production controls are referred to on every new order arriving at the plant. To inform the customer on a delivery date, records and charts are consulted to determine the work ahead. Materials and machinery are scheduled in order to plan production schedules ahead, which in turn maintains employment at a constant level.

Controlling the Material Supply

The supply of raw materials and semi-finished parts necessary to complete the job are checked before any processing can start.

The production planning department prepares a bill of materials which is sent to stock storage. With the list, the stores manager checks the records to determine (1) what materials are on hand; (2) what components will be fabricated in the plant, and (3) what materials or sub-assemblies will be secured from vendors.

Raw materials in stock are earmarked for the order and arrangements are made to secure addition-



Production of over 25,000 parts for turet lathes and small tools is controlled by relatively few records at Warner & Swasey Co., of Cleveland. Approximately 75 percent of the production is based on pre-determined schedules for a given period. An out-of-stock condition on any of the thousands of parts might hold up the entire operations with serious loss. Shown on these pages are the Warner & Swasey forms:

A PARTS LIST is compiled of all components needed for assembly operations.

B OPERATION SHEET lists various processing jobs required for each part.

1 SHOP TRAVELER, an envelope, has routing in front; Nos. 1 and 2, inside.

2 RECEIPTS - DISBURSEMENTS part record (buff) remains in central control files.

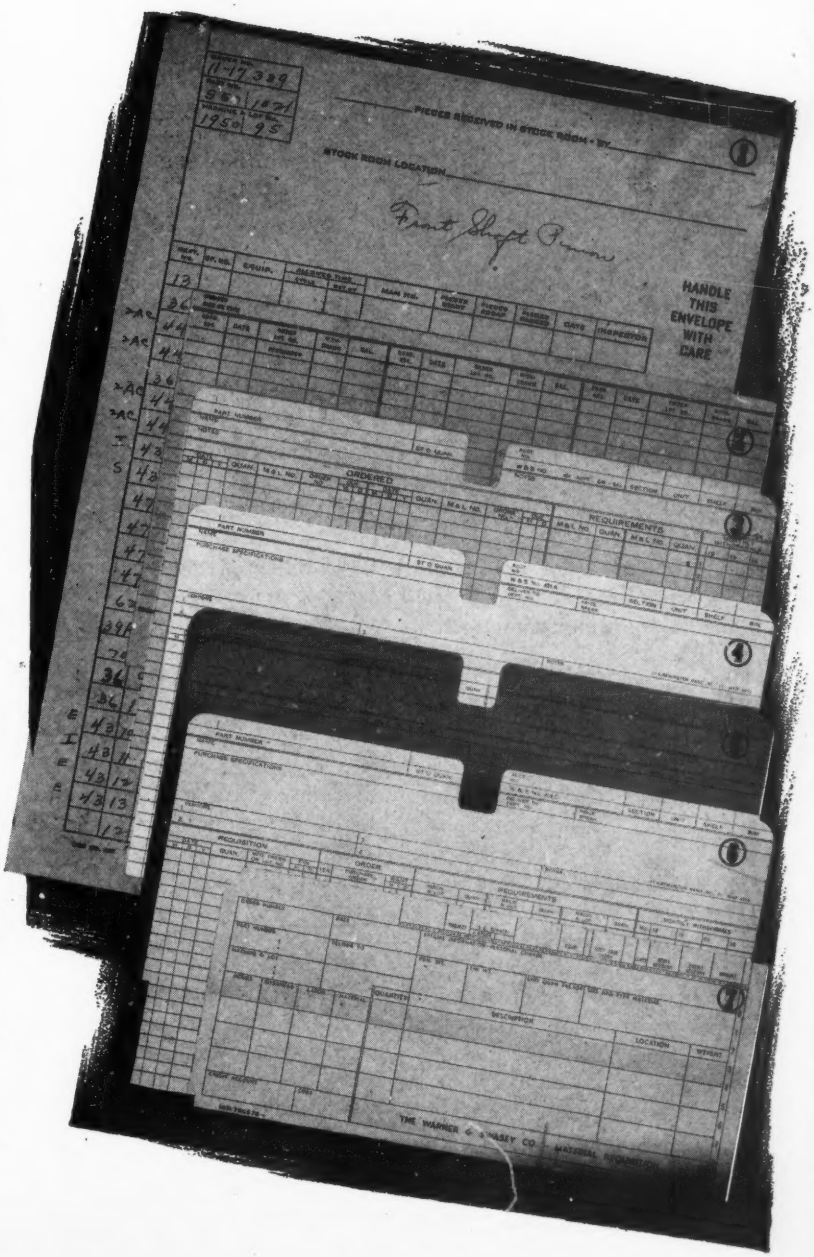
3 PLANT MADE parts are controlled on buff card kept in central control files.

4 PURCHASED PARTS are listed on white card which is also authority to purchase.

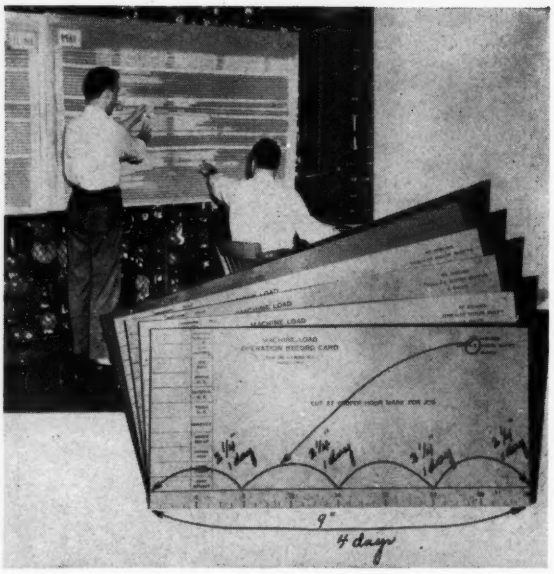
5 ASSEMBLED TOOLS card (orange) lists number available for shop use or sales.

6 SUPPLIES, oils, cutting wheels, etc. needed in plant, are shown on blue record .

7 MATERIAL REQUISITION is standard form showing disbursement from stock room.



PARTS are routed to departments by means of tags attached to one of all similar items at Warner & Swasey.



MACHINE loading is simplified by dividing day into 10 units and indicating busy and idle time.

al supplies, if necessary, to keep a continuous flow into the processing departments after work has been started. Purchase orders are issued for components supplied by vendors. The orders stress the date before which delivery must be made.

Material control is projected in several ways so that instant appraisal can be obtained. In some plants, a peg board with hundreds of holes arranged in horizontal and vertical rows is used. Daily consumption of each type of material is established. An adjustable "minimum line" is extended vertically across the board. Materials are represented by flexible tapes extending from one side in a horizontal position across the board. As the records show that materials are used, the tapes are shortened. When the peg end of the tape nears the "minimum line", action is started. Material on order is expedited. New purchase orders are issued for additional supplies. A system of this kind is readily maintained in a large plant by means of five forms.

Keeping the Wheels Turning

Assured of adequate materials, production control can schedule available machines, and each unit has an individual record card.

Graphic devices such as barred graphs or flexible tapes are frequently used as indeces to machine loads. With barred graphs, loaded time is marked while "free" time is left blank. Loads can be assigned to the machine during the unoccupied periods. It is obvious that production loss would be inevitable without the necessary records which supply the data for the visual charts.

In some control systems, the day or shift is divided into 10 units. These units may be more or less than an hour. New work is also figured in units according to established standards. When a job is estimated to take 40 units, four days or shifts are blocked out on the graph, indicating the machine will be in use during a certain period in the month.

Another system uses the retractable tape and peg board. Adjustments are made in the tape and pegs according to the progress of the job. Decrease in the length of tape indicates a reduction in the machine load.

A third method of machine loading utilizes a vertical filing system with job records filed according to the machine numbers. The production manager can determine the amount of work ahead by checking the number of cards, due dates and sizes of orders. Transparent colored signals are usually placed over numbers on the work cards to indicate the total number of hours required for the job.

Control of Processing

With availability of machines and materials assured, attention can be devoted to processing, fabricating and assembly operations. There are several different types of forms used for maintaining records of these phases of production.

One control system makes up a master record of all materials, operations and other data related to the job. This master copy is reproduced by some duplicating method in order to provide sufficient copies for every department concerned with the job. Distribution is controlled by card color and identification printed at the top of each copy. The various departments pay attention only to their operation numbers. When the process is completed, the work is sent on to the

(Turn to page 64)

You can boost labor productivity and cut costs

WITH THE BELL PRIME MOVER*

● It takes half-ton loads of concrete, sand, scrap, dirt . . . any heavy or bulky materials.

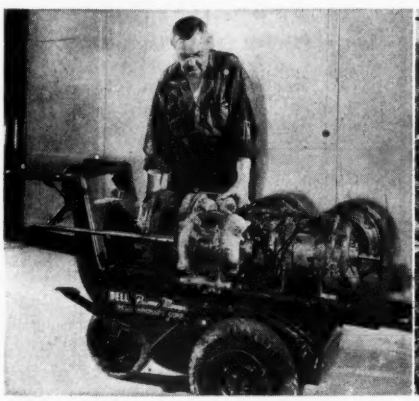
● The BELL Prime Mover is a major advance in materials-handling equipment. It combines the functions of a giant *wheelbarrow*, half-ton *platform truck*, and "baby" *bulldozer*. Its versatility and carrying capacity enable you to mechanize "slow" jobs at a fraction of your present labor costs. For example . . .

It does everything a wheelbarrow can do, yet has up to four times the capacity of a wheelbarrow . . . will do the work of a four-man wheelbarrow gang. No pushing or lifting is required, and it dumps mechanically.

When a platform carrier is needed, you can lift off the bucket and replace it with a 9-square-foot platform body that hauls half-ton loads.

If there's a light grading or scraping job to be done, a 50-inch three-position steel blade can be attached in a jiffy. This blade does a first-class snow-plow job, cleans up scrap yards . . . even moves sand at a Palm Beach hotel.

Hundreds of Prime Movers have been bought by cost-conscious foundries, factories, cemeteries, greenhouses, brickyards, coalyards, and other enterprises. Write for facts on how these customers are saving up to 300% on labor costs and are getting increased labor productivity with this versatile materials handler.



● The platform is ideal for motors, concrete blocks, paper... any "packaged" materials.

● The 50" blade adapts this unit for scraping, grading... any "baby bulldozer" assignment.

HERE ARE A FEW TYPICAL USERS...

Lima Locomotive Works
Damascus Steel Casting Co.
Joseph Schlitz Brewing Co.
Derby Gas & Electric Co.
Allegheny-Ludlum Steel Co.
American Brake Shoe Co.
Yates-Lehigh Coal Company
Republic Steel Corporation
Grand Canyon National Park
B. F. Goodrich Company
International Harvester Co.

SEE OUR EXHIBIT at the ARBA Road Show, Soldiers' Field, Chicago, July 16 to 24

FEATURES:

- takes half-ton loads up 20% grades
- bucket holds 10 cu. ft. . . . 18 with sideboards
- gear driven...no belts or chains
- fully enclosed engine protected against dirt and moisture
- clutch, engine, transmission all run in oil
- half-ton platform body available; also 50-inch "baby bulldozer" blade
- switch from bucket to platform without tools... in less than a minute
- turns in its own length (63½"); width 31½"
- 3-gallon tankful of fuel gives 8 hours continuous service

A PRODUCT OF **BELL** *Aircraft* CORPORATION

★ PATENTS & T.M. REG. PENDING. COPYRIGHT, 1948

SEND COUPON NOW

Bell Aircraft Corporation
P. O. Box 1L6, Buffalo 5, N. Y.

Please send me facts on how the Prime Mover can be used profitably in my business. We are in the

.....(business).

Name.....

Company.....

Address.....

City, Zone & State.....

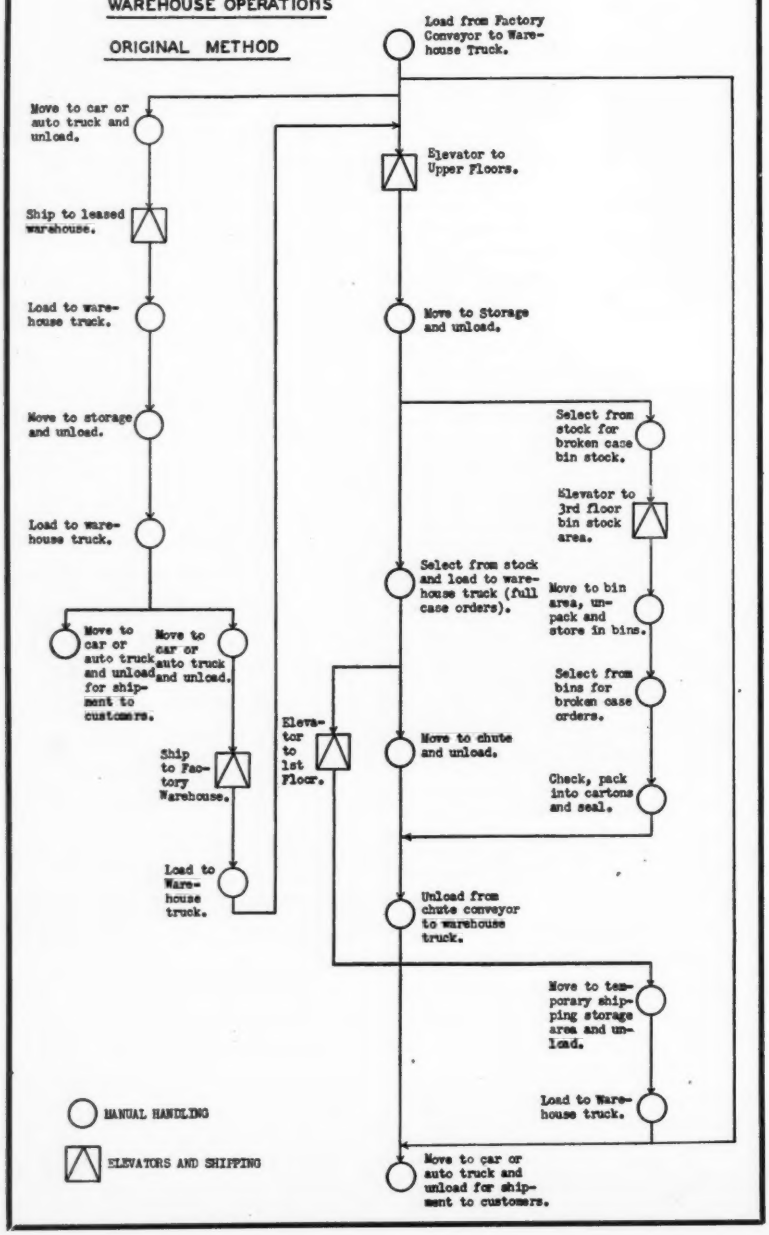
Saved: 30% of investment in only one year!

2ND PRIZE WINNER IN THE 1947 FLOW COST REDUCTION CONTEST

FLOW CHART OF MATERIAL HANDLING IN WAREHOUSE OPERATIONS

FIGURE I

ORIGINAL METHOD


Load from Factory Conveyor to Warehouse Truck.
Move to car or auto truck and unload.
Elevator to Upper Floors.
Ship to leased warehouse.
Load to warehouse truck.
Move to Storage and unload.
Move to storage and unload.
Select from stock for broken case bin stock.
Elevator to 3rd floor bin stock area.
Load to warehouse truck.
Select from stock and load to warehouse truck (full case orders).
Move to bin area, unpack and store in bins.
Move to car or auto truck and unload for shipment to customers.
Move to car or auto truck and unload.
Select from bins for broken case orders.
Elevator to 1st Floor.
Ship to Factory Warehouse.
Move to chute and unload.
Check, pack into cartons and seal.
Load to Warehouse truck.
Unload from chute conveyor to warehouse truck.
Move to temporary shipping storage area and unload.
Load to Warehouse truck.
MANUAL HANDLING
ELEVATORS AND SHIPPING
Move to car or auto truck and unload for shipment to customers.

PART II

This paper won the second prize of $300 in the 1947 FLOW Cost Analysis Contest. See the prize-winning papers beginning with the March issue. The second $1500 FLOW Contest is open. Write us for your entry blank now. Your paper may be a winner.

By CHARLES H. DAY
Assistant to General Manager,
Chicago Operations
Sherwin-Williams Co., Chicago

Order Filling

AS mentioned in last month's article, most orders called for both full case lots and less than case lot quantities.

From the variation in the amounts of various items ordered, it was apparent that parts of the orders could be filled via lift truck directly from the reserve stock areas, while the bulk of the man power would be required in filling the portions of the orders calling for a small number of cartons and which would be filled from the order assembly area. Through this area an overhead drag-chain was to be installed for transportation of 4-wheel trucks to shipping. This type of conveyor system relieved the order fillers from the necessity of having to push heavy loads. And it does not interfere with lift truck operations. Once a carton is

Part I, which appeared in the May issue, features two tables which compared the units produced per manhour under the old and new methods. Also discussed in detail is the planning that preceded the construction of the large project, including operating methods.

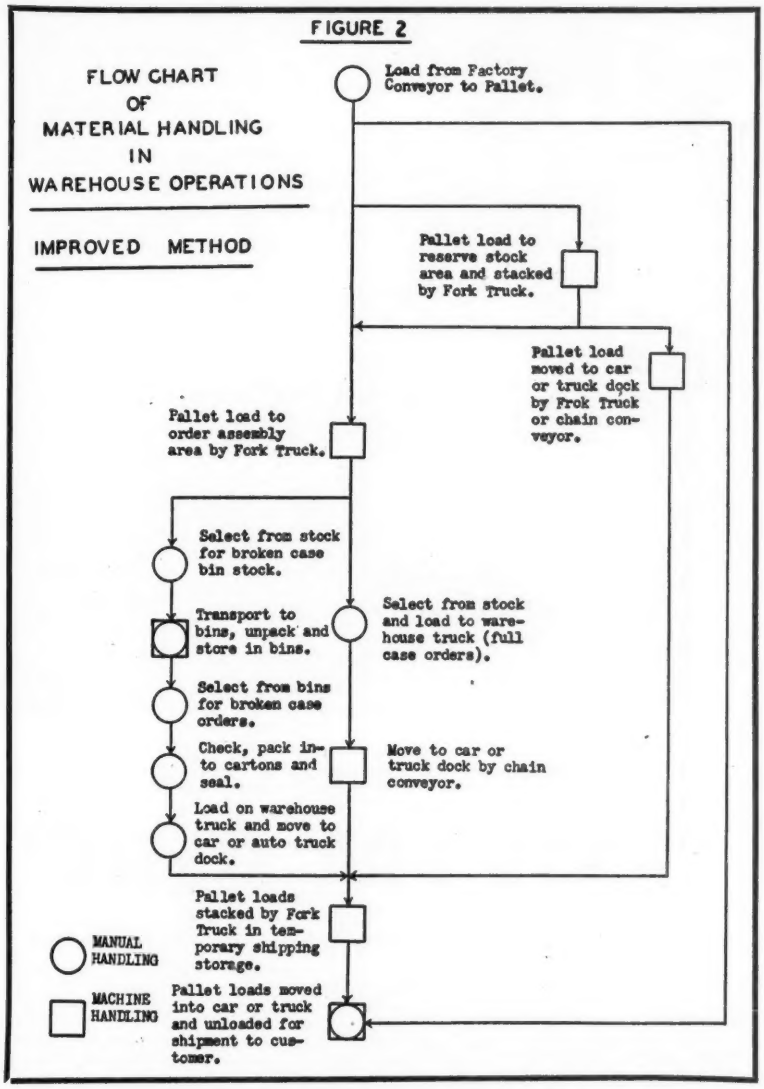
placed on a truck, it is not necessary in most cases to remove it until it is stowed in a car or highway trailer. In those cases where it was going to be necessary to rehandle the materials at the shipping location, the cartons and pails are palletized as the orders are being filled.

Handling orders for less-than-case-lot quantities was an expensive operation as it represented 35 to 40 per cent of the total productive man hours, yet it accounted for less than 6 percent of the total tonnage shipped. Special racks with bands of roller conveyor sections were designed to replace the open type bins that were formerly used for storing less than case lot items.

Materials are selected from the racks, placed in a tray which has been placed on a flat roller type conveyor. When the order is completed or the tray is filled, it is pushed onto a live belt conveyor which carries it to a packing station. Pins are first set in one of four holes in both ends of the tray. Each of these holes corresponds with a packing station, where a bar above the conveyor is positioned so as to catch the pin and slide the tray into the proper station.

At the latter, the proper size carton is removed from chutes and placed on a conveyor that is parallel to the first conveyor mentioned. Cans are taken from the tray and packed in the carton, which is sealed. The completed containers are pushed onto a live conveyor which takes them across a scale and up to the shipping location where they are matched up with the balance of the order filled from the full case stock. The empty trays are returned to order filling on the looped conveyor which supplies the packing department.

FIGURE 2


FLOW CHART OF MATERIAL HANDLING IN WAREHOUSE OPERATIONS
IMPROVED METHOD
Load from Factory Conveyor to Pallet.
Pallet load to reserve stock area and stacked by Fork Truck.
Pallet load moved to car or truck dock by Frok Truck or chain conveyor.
Pallet load to order assembly area by Fork Truck.
Select from stock for broken case bin stock.
Transport to bins, unpack and store in bins.
Select from stock and load to warehouse truck (full case orders).
Select from bins for broken case orders.
Check, pack into cartons and seal.
Move to car or truck dock by chain conveyor.
Load on warehouse truck and move to car or auto truck dock.
Pallet loads stacked by Fork Truck in temporary shipping storage.
MANUAL HANDLING
MACHINE HANDLING
Pallet loads moved into car or truck and unloaded for shipment to customer.

Compare the moves made now, above, with those necessary under the old method, opposite page.

Shipping Operations

Truck load, carload, and less than carload shipments, each presented a somewhat different problem. Fifty-five gallon drums, incidentally, are transported to the warehouse by the tractor-train method.

Carload shipments can be accurately scheduled. Inasmuch as the greater part of the tonnage for each car is made up of material handled by fork trucks directly from the reserve stock areas and since each carton does not have to be stencilled with destination marks, there is no particular problem involved. The parts of the order which came from the order assembly area and the less than case lot packing department are delivered to the car-loading area by means of the overhead drag chain.

Truckloading presented a somewhat different problem as it was imperative that highway vehicles be loaded promptly. Merchandise for shipment had to be on hand at the shipping location prior to the arrival of the trucks. Materials were, therefore, brought to the loading location by the same means as those for carload shipments. A fork truck of smaller design runs the pallet loads into the outbound vehicles. This method allows all trucks to be loaded quickly.

Less than truck load shipments

presented an entirely different problem. These orders have to be placed in the truck delivering to city customers or freight depots in station stop order. To avoid resorting and rehandling, all such orders are accumulated throughout the day. The orders are routed in the order in which they are to be loaded and are then set out, checked, and loaded in proper sequence at night. The trucks are ready to deliver early the following morning.

Communications Systems

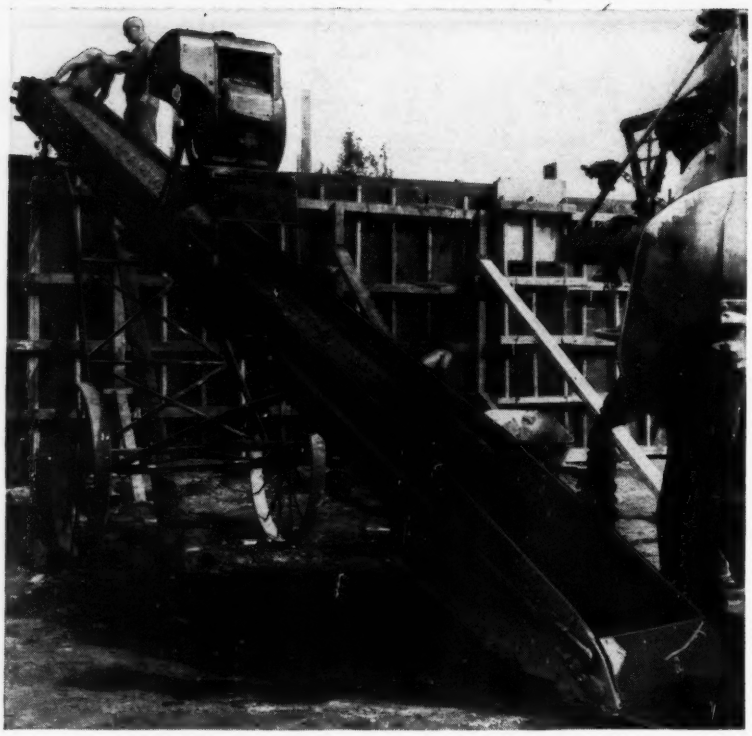
All the operations have been tied together by means of pneumatic tubes for delivering orders, Tel-autograph for passing written instructions, and an intercommunicating system for issuing instructions, both with regard to the handling of orders as well as for the operation of the conveyor systems.

The material flow chart of the improved operation shows in general the new handling method. When compared with the flow chart of the old method, it can be seen that the number of physical handlings has been reduced greatly, powered equipment being utilized wherever possible.

General Layout

After the general handling system and the pallet size had been determined, it was necessary to complete a detailed layout before the final dimensions of the building could be determined or the proper amount of equipment ordered.

It was thought advisable to have all shipping operations, both carloads or truckloads, located in one general area. It was desirable to have incoming stock arrive on a conveyor somewhere near the center of the building, and to have the order assembly area located near the shipping location and preferably in a place of limited head room so as to avoid taking space where valuable head room was available. Many other structural, layout and handling details were considered.



Farquhar Trough Conveyor
"PAYS FOR ITSELF"
handling wet concrete from mixer to forms

ON one job alone, handling wet concrete from mixer to forms, this Farquhar Trough Conveyor — Model 343 — more than *paid for itself* in time and labor saved. No hoist operator was needed; scaffolding was eliminated on this construction project . . . the Farquhar Conveyor fed concrete to the forms at the rate of one cubic yard a minute—faster than the contractor believed was possible.

For All Handling Jobs

General-utility Farquhar Trough Conveyors handle sharp or abrasive materials, fine or powdery materials, small bags or bundles *faster, better, cheaper* than old-fashioned handling methods. Contractors, chemical plants, coal yards, warehouses—all industries turn to Farquhar for the right answers to specific handling problems. Farquhar offers a complete line of conveyors for portable, semi-permanent or permanent use, handling all kinds of loose or packaged materials. Tell us your problem—we have the know-how to help you. Write A. B. Farquhar Co., Conveyor Division, 206 Duke St., York Pa., or 616 W. Elm St., Chicago 10, Ill.

MOVING DIRT *from basement excavation direct to dump truck with gas engine-driven Farquhar 334-T Conveyor saves time for contractor . . . hard, back-breaking work for men.*

Farquhar PORTABLE OR PERMANENT MATERIALS HANDLING CONVEYORS

A. B. FARQUHAR COMPANY · CONVEYOR DIVISION

HYDRAULIC PRESSES
FARM EQUIPMENT
FOOD PROCESSING AND
SPECIAL MACHINERY

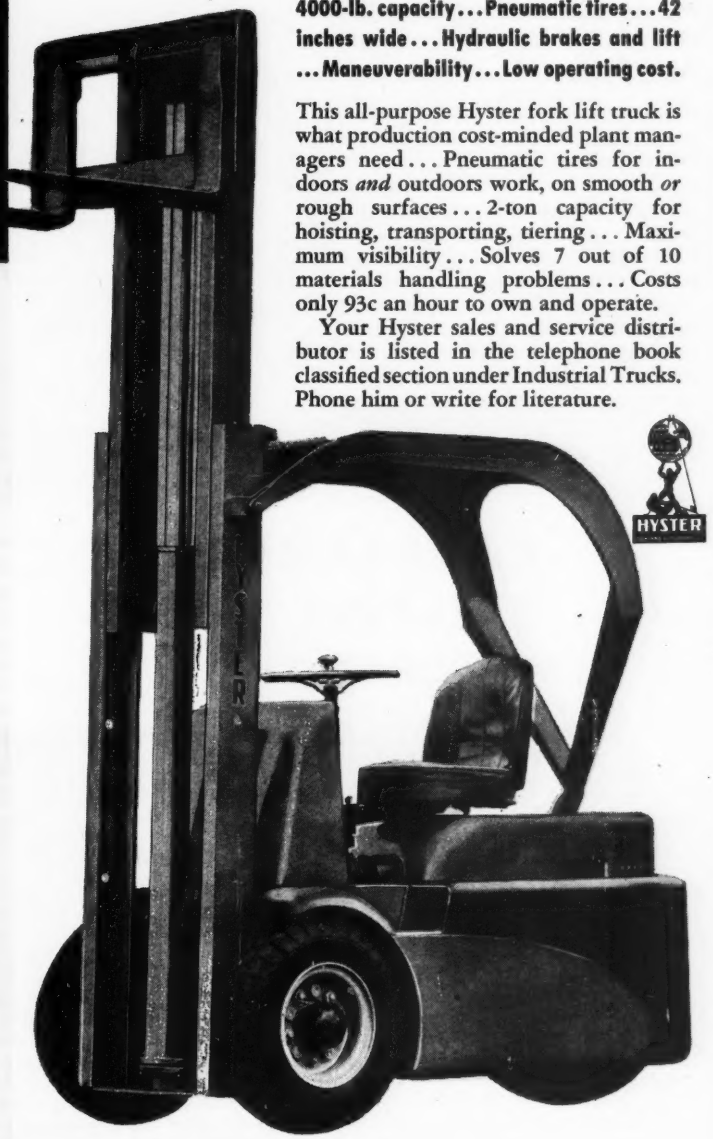
HYSTER "40"

CURRENT DELIVERY TO MANUFACTURING INDUSTRIES

4000-lb. capacity... Pneumatic tires... 42 inches wide... Hydraulic brakes and lift ... Maneuverability... Low operating cost.

This all-purpose Hyster fork lift truck is what production cost-minded plant managers need... Pneumatic tires for indoors *and* outdoors work, on smooth *or* rough surfaces... 2-ton capacity for hoisting, transporting, tiering... Maximum visibility... Solves 7 out of 10 materials handling problems... Costs only 93c an hour to own and operate.

Your Hyster sales and service distributor is listed in the telephone book classified section under Industrial Trucks. Phone him or write for literature.



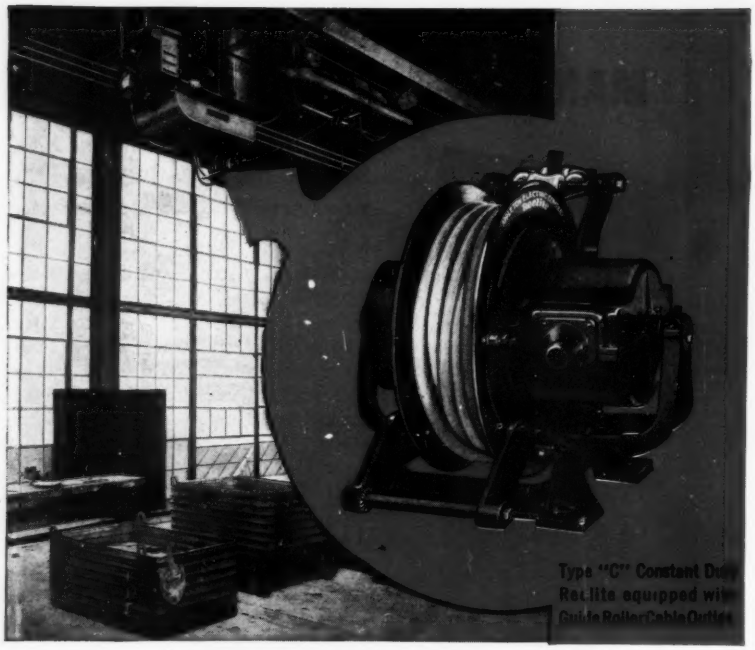
GO TO YOUR HYSTER DISTRIBUTOR FOR CURRENT DELIVERY

ALASKA—Northern Commercial Co.
BIRMINGHAM, ALA.
S & T Equipment Co., Inc.
BROOKLYN, N. Y.—A. S. Rampell
BUFFALO, N. Y.—Rapids Handling Equipment Co. of Buffalo, Inc.
CALGARY, ALTA.
A. R. Williams Machy. Western, Ltd.
CHATTANOOGA, TENN.—Embry Brothers, Inc.
CHICAGO, ILL.—Hyster Company
CINCINNATI, O.—Oral T. Carter & Associates
CLEVELAND, O.—Morrison Company
DALLAS, TEX.—C. H. Collier Company
DENVER, COLO.—Paul Fitzgerald
DETROIT, MICH.—Bentley & Hyde
GRAND RAPIDS, MICH.—Bentley & Hyde
HALIFAX, NOVA SCOTIA
A. R. Williams Machy. Co., Ltd.
HONOLULU, T. H.—Electric Steel Foundry Co.
HOUSTON, TEXAS—C. H. Collier Company
INDIANAPOLIS, IND.
Central Rubber & Supply Co.
JACKSONVILLE, FLA.
L. S. Teague Equipment Co.
KANSAS CITY, MO.
Industrial Power Equipment Co.
LOS ANGELES, CALIF.—Hyster Company
LOUISVILLE, KY.—Embry Brothers, Inc.
MEMPHIS, TENN.
Hyster Co. of Louisiana, Inc.
MILWAUKEE, WIS.—Hyster Company
MINNEAPOLIS, MINN.—W. S. Nott Company
MOBILE, ALA.—S & T Equipment Co., Inc.
MONTREAL, P. Q.
A. R. Williams Machy. Co., Ltd.
NASHVILLE, TENN.—Embry Brothers, Inc.
NEW ORLEANS, LA.
Hyster Company of Louisiana, Inc.
NEW ROCHELLE, N. Y.
Eastern Industrial Sales Co.
OTTAWA, ONT.
A. R. Williams Machy. Co., Ltd.
PHILADELPHIA, PA.—Rapids Handling Equipment Co. of Phila., Inc.
PHOENIX, ARIZ.—Equipment Sales Company
PITTSBURGH, PA.—Equipco Sales Company
PORTLAND, ORE.—Hyster Sales Company
RICHMOND, VA.—Richmond Auto Parts, Inc.
ROCHESTER, N.Y.—Rapids Handling Equipment Co. of Buffalo, Inc.
ST. JOHNS, N. F.—City Service Company, Ltd.
ST. LOUIS, MO.—Wharton L. Peters, Inc.
SALT LAKE CITY, UTAH
Arnold Machinery Company
SAN FRANCISCO, CALIF.—Hyster Company
SEATTLE, WASH.—Hyster Company
TORONTO, ONT.
A. R. Williams Machy. Co., Ltd.
VANCOUVER, B.C.
A. R. Williams Machy. Western, Ltd.
VICTORIA, B.C.
A. R. Williams Machy. Western, Ltd.
WINNIPEG, MAN.
A. R. Williams Machy. Western, Ltd.
YUKON TERRITORY
Northern Commercial Company

HYSTER COMPANY

THREE FACTORIES

2931 N. E. CLACKAMAS ST... PORTLAND 8, OREGON
1831 NORTH ADAMS STREET... PEORIA 1, ILLINOIS
1031 MEYERS STREET... DANVILLE, ILLINOIS



CARETAKER OF ELECTRIC CABLE

CONSTANT DUTY

APPLETON REELITE

TRADE MARK

Keeps Conductor Cable Safe and Sound

Step up the pace of your mobile electrical machinery with Appleton Constant Duty Reelites—smooth-running caretakers of electrical cable that automatically take up and pay out cable connected to moving units. These ruggedly constructed Constant Duty Reelites hold the cable taut, eliminate kinks and tangles, prevent breaks—speed production and guard men and machinery against accidents.

Throughout American industry, thousands of Appleton Constant Duty Reelites see action every day on an endless variety of moving electrical machinery . . . lifting magnets, hoists, cranes, chargers, motor generator sets —much of the moving electrical equipment so vitally essential to profitable production. Appleton Reelites are manufactured in a variety of types and sizes to provide top efficiency on every job.

Construction of Appleton Reelites is dependable and strong. Ball-bearings eliminate undue wear and provide a lifetime of trouble-free reeling.

Sold Through Electrical Wholesalers

APPLETON ELECTRIC COMPANY

1728 Wellington Avenue • Chicago 13, Illinois

14 Branch Offices and 7 Resident Representatives in All Principal Markets

SEND TODAY for 50-page Bulletin No. 504, giving complete technical details about all kinds and sizes of Reelites. Reelites for the transmission of air and fluids, Appleton Retract-o-Reels and Appleton Portable Reelites are also graphically illustrated and described in this free Bulletin. Further information on Appleton Reelites is listed in Sweet's File, Page 2a/15.

APPLETON

CONDUIT FITTINGS • LIGHTING EQUIPMENT • OUTLET AND SWITCH BOXES

EXPLOSION-PROOF FITTINGS • REELITES

A classification chart was then prepared for each size package to be handled. For example, taking the one-gallon size container, if the total inventory for a particular item were less than 15 containers, the entire stock would be carried in the less than case lot department (using the specially designed racks). Such a classification was designated as "A".

If the maximum stock of this item were to be between 16 and 32 containers, it would occupy space not only in the less than case lot department racks but also shelf space for four cartons (there being four gallons to the carton) in the order assembly area. This was designated as classification "B". The next, classification "C", in addition to space in the less than case lot department, would occupy a given amount of floor space in the order filling area; "D" would require a pallet space in the order assembly area; "E" would require a given amount of reserve stock space in addition to the order assembly space, and so on up. The classifications from here on up would depend on the stock piling which would tie in with the column spacing of the building.

After the classification charts were prepared for each size container, each item in the inventory was classified and a summary prepared. Since each classification required a fixed amount of floor space, a definite number of pallets, a definite amount of aisle space, etc., the following determinations were made:

1. Total area of building. 2. Amount of order assembly area required. 3. Amount of surplus stock area required. 4. Number of pallets required. 5. Length of aisles required. 6. Length of monorail conveyor required. 7. Number of special racks required in the less than case lot packing department. 8. Number of pallet racks required in the order assembly area. 9. Amount of steel shelving required in the order assembly area.

This information, together with the general determinations previ-

ously mentioned, gave all the necessary data with which to proceed with the detailed layout.

Operating Costs—Conclusions

The table of the new, improved operation, given in last month's article, shows the actual man hours that have been required to operate this warehousing and shipping operation. When compared with the table of the old method, it can be seen that man hours have been reduced by 42.5 per cent, and the tonnage handled was increased by 86 per cent. Had the increased volume of business been handled at the old cost level, as shown in last month's chart on the old method, it would have taken 819 man hours more per day than is now being required. As explained in last month's article, this amounts to an annual saving of $288,000.00.

For comparative purposes, unit costs for the old method are repeated on this chart.

Following are the main conclusions which can be drawn from the developments and operations.

1. It proved to be economical to provide numerous types of handling equipment to work in conjunction with each other. That is, specialized equipment to handle a specific part of the operation proved to be more satisfactory than trying to adopt one type of handling equipment to all the operations.

2. Costs are not necessarily determined by the number of times materials are handled. In this case it proved more economical to rehandle materials in some cases in order to confine the bulk of the man power to a small area rather than not rehandle the materials and have the entire work force cover a much greater area. Such a procedure, however, pre-supposes that the rehandlings will be done with efficient methods.

3. Adequate cost control methods for each operation are necessary so that it can be determined where specialized handling equipment might be of value.

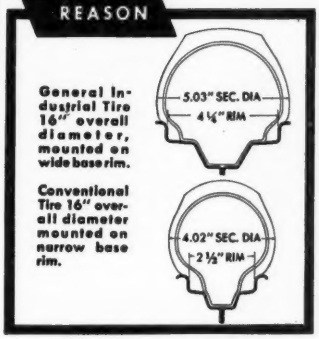
6 reasons why

WIDE BASE

GENERAL INDUSTRIAL PNEUMATICS

move loads faster, cheaper

SEE THE REASON


General Industrial Tire 16" overall diameter, mounted on wide base rim.
5.03" SEC. DIA.
4 ½" RIM
Conventional Tire 16" overall diameter mounted on narrow base rim.
4.02" SEC. DIA.
2 ½" RIM

Bigger Air Volume makes the difference

since General Industrial Tires, mounted on General's exclusive wide-base rims, give you a greater volume of air per tire... you can carry a greater load at the same pressure or the same load at lower pressure.

1 **CARRY HEAVIER LOADS**—Greater air volume permits larger loads without damage to floors or tires.

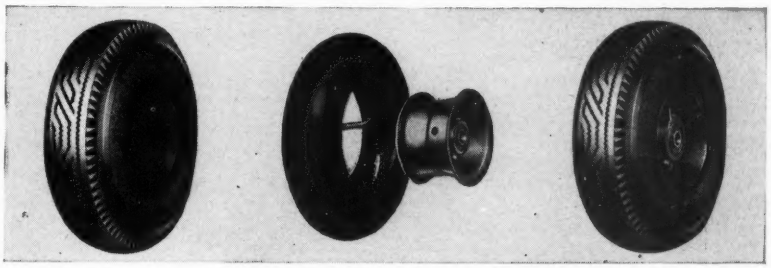
2 **CUSHION THE LOAD**—Lower air pressure provides a softer ride, reduces breakage and spillage.

3 **EASIER TO CHANGE**—Tires can be changed in a few minutes. Money saved on labor is money in your pocket.

4 **RUN BETTER AT HIGHER SPEEDS**—Wide-base rims give greater stability, less sway, better stopping.

5 **LAST LONGER**—Built on the same machines, and of the same Top Quality materials as famous General Truck Tires.

6 **REDUCE WORKER'S FATIGUE**—Trucks on Generals move easier, with less effort, less energy or less fuel. Jolts and jars are reduced to a minimum.



COMPLETE FACTORY ASSEMBLED UNITS

You can order General Industrial Pneumatics in complete units of tire, tube and wheel all inflated and ready for installation.

Size for size, these mighty midgets of the General Tire line, match their "big brothers" in strength, long wear and all around, money saving ruggedness. Try them. You'll find you can rely upon them.

New brochure tells how to move loads and mobile equipment cheaper and faster. Write Dept. 1, The General Tire & Rubber Co., Akron, Ohio.

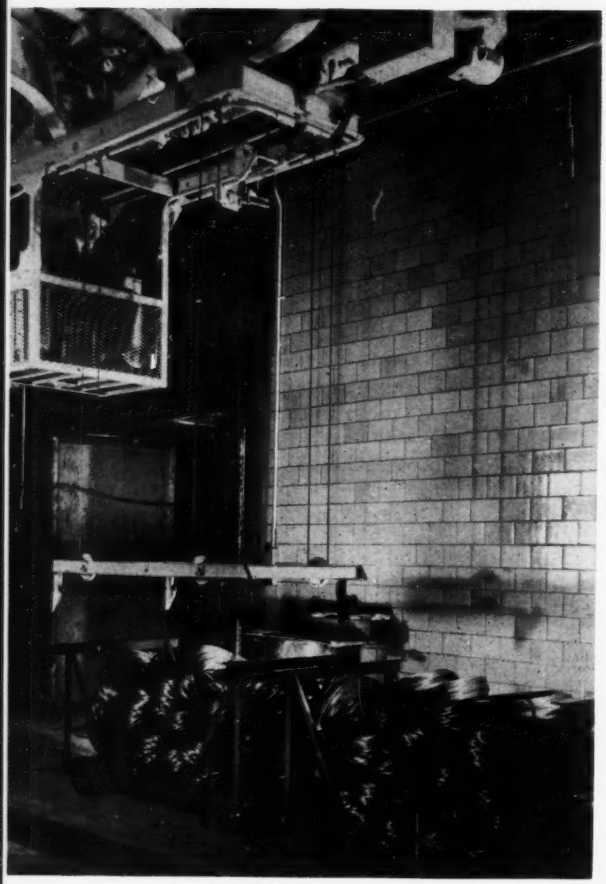
THE GENERAL TIRE & RUBBER CO.
AKRON, OHIO

The GENERAL TIRE

COILS RIDE THE MONORAILS

By **LEONARD R. HUNT**
Mechanical Engineer
Wire Rope Division
Jones & Laughlin Steel Corp.
Muncy, Pa.

MONORAIL SYSTEM, CAB-CONTROLLED HOISTING UNITS, STACKING RACKS, AUTOMATIC GRAB, FORK LIFT TRUCKS



STACKING - TYPE "wire boats" are spotted in "landing strip" by fork truck for hoist handling.

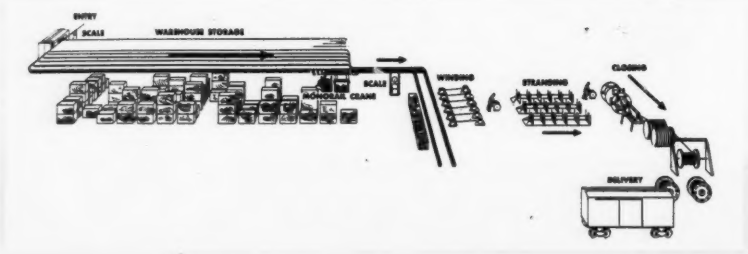
AN OVERHEAD monorail handling system recently installed at the Wire Rope Division, Jones & Laughlin Steel Corp., Muncy, Pa. has done away with manual lifting and back strains, improving plant safety and making 50 per cent of workers available for more productive jobs. Wire kinks and other damage were also materially reduced, resulting in higher production and better quality of product.

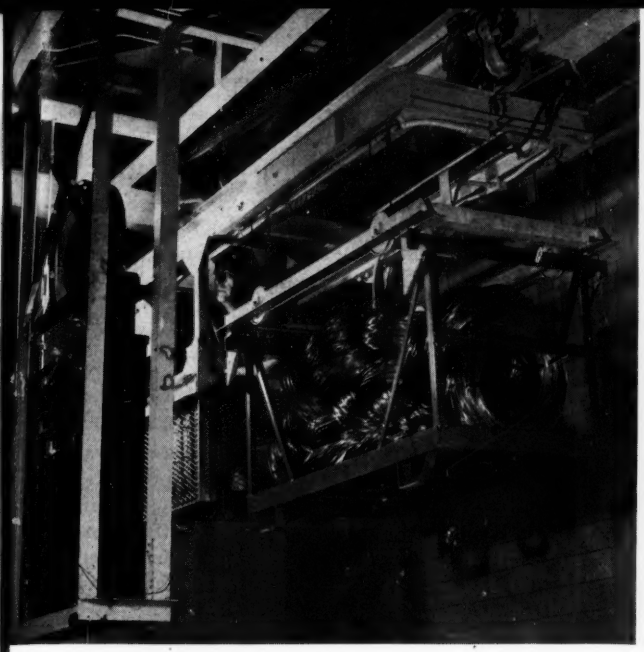
Cab-operated hoisting units daily move some 50 tons of wire in coils on the 18 rails of the monorail system in the rack-type skids, shown, which are stacked three high. Unloading from cars is by fork truck using a crane attachment; the loaded "wire boats" are moved by fork truck to a "landing strip" under the hoist units. From receiving through warehousing and production, all handling is a one-man job, controlled from the hoist cab. Incoming loads (4000 pounds or better) first go to a monorail scale, which prints the weight on the inventory card that records the size, quality and number of coils, the date and "boat" number.

Each of the 18 longitudinal monorails is lettered, and 50 stacking rows are measured off. With size and quality of stock for reference, the hoist operator determines the rail letter and the storage row from a chart in the cab. Switches are at each end of the system, two lateral tracks serving production. A pointer on the cab and an indicator on the rail show the operator the precise spot for lowering or lifting.

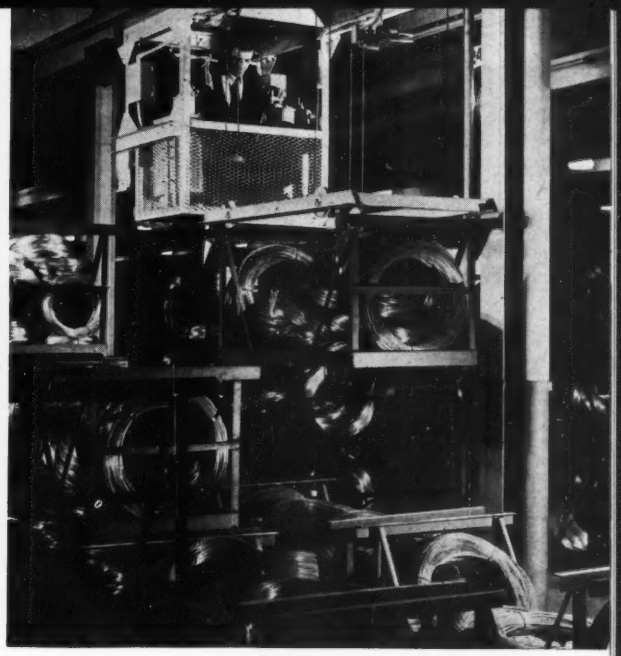
Material flow from the warehouse to the winding reels is scheduled by a foreman who gives the

FLOW DIAGRAM shows movement of coils from car through warehouse, production, then to shipping department.



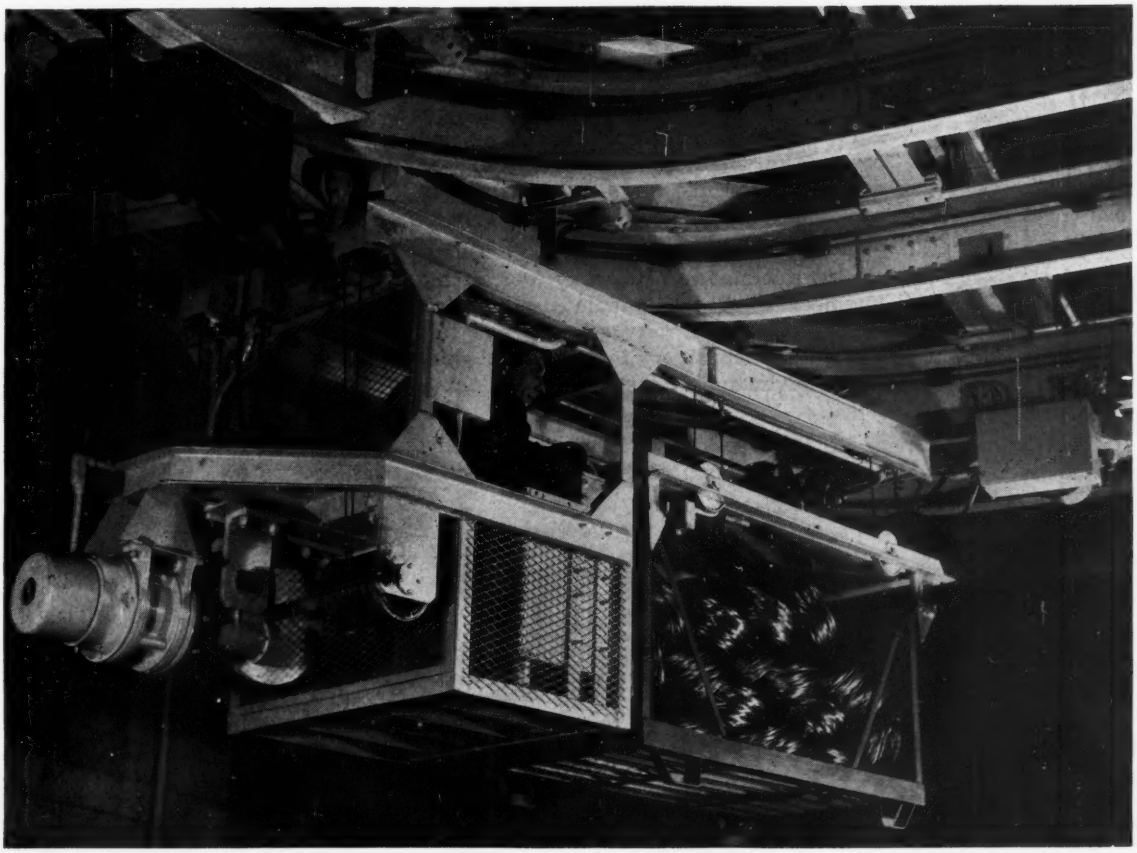


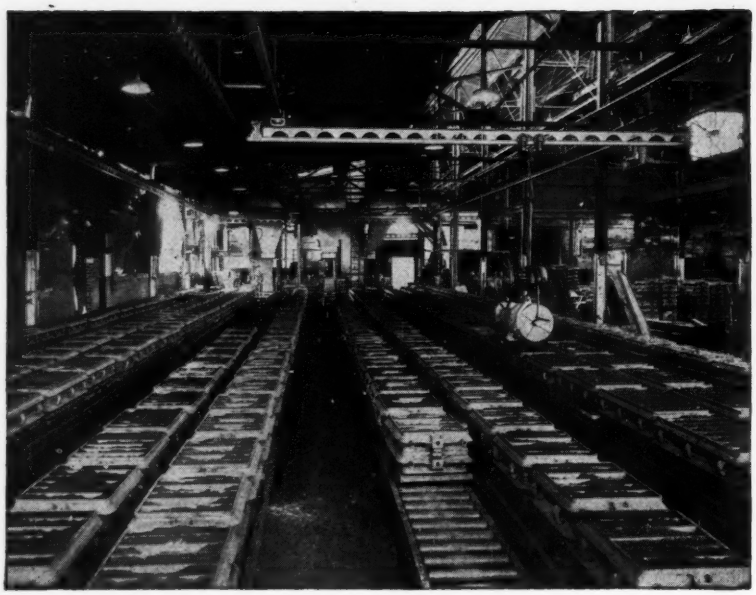
THIS OVERHEAD SCALE weighs all incoming loads, prints a complete record on inventory cards. Paperwork is simplified



ACCURATE SPOTTING (three high) is assured by lines on top of hoist cab and on the monorail. Time is saved.

SYSTEMATIC STORAGE is provided by lettered rails and numbered storage rows. Saving: 20,000 sq. ft. of floor area.





stock operator the requirements on a ticket, indicating the wire size, quality and number of racks or boats needed. The cab unit delivers the material, via another scale, direct to start of production, as shown in the flow diagram. Bobbins and reels are rolled between machines, then to outbound vehicles. The tierable racks used have 30 cu. ft. capacity.

Monorail handling, through high stacking, has made 20,000 square feet of former storage area available for additional production units. Monorail handling has also mad possible the new, streamlined operation, centralized and systematic, with the greater safety and savings indicated earlier.

Staying Power

that means economy

There is one thing that can always be said about conveying equipment that goes into heavy industry — it gets an awful beating. And, it's got to be tough to stay on the job. Plant operating men, responsible for keeping costs down, know that very well — and so do conveyer people who have had years of experience in designing conveying equipment that will work under severe service.

Mathews Engineers like heavy jobs, probably because they've handled so many of them. They've put gravity and power conveyers and special conveying machinery in just about every place it can be used to advantage in foundries, steel plants and brass mills.

For these industries, Mathews designs and builds equipment that is heavy enough to stay a long time in a rough game.

MATHEWS CONVEYER COMPANY
ELLWOOD CITY, PENNSYLVANIA

MATHEWS CONVEYER COMPANY WEST COAST
SAN CARLOS, CALIFORNIA

MATHEWS CONVEYER COMPANY, LTD.
PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities

Institute Chapter and Association Activities

With 190 people in attendance, the April meeting of the New England Chapter of the Material Handling Institute heard an address by R. W. Mallick of the Westinghouse Corp. "Costs vs. Design in Material Handling Planning" was the title of his talk. The meeting was held at the Hotel Kenmore, Boston. Plans for a proposed New England Material Handling Exposition to be held next fall were discussed.

Several hundred members of the Materials Handling Society of Philadelphia were guests of Army officers, during April, at the Philadelphia Quartermaster Depot. Demonstrations were given of Army warehousing methods involving the use of material handling equipment. A conducted tour of inspection was arranged throughout the Supply Depot, the largest of its type in the world.

The April meeting of the Indiana Materials Handling Society was highlighted by a series of short talks from the members. Suggestions were offered for future topics of discussion and for improvements which they thought could be made to assist the society in covering a wider field of industry.

A new chapter of the Material Handling Institute is being organized in Toledo, Ohio. Highlighting the first meeting was an address by R. Kennedy

Hanson, the Institute's secretary-treasurer. Hanson talked on the simple requirements for forming a chapter, and presented samples of a constitution outline, due cards, and questionnaires for obtaining topics for future meetings. It was agreed to affiliate with the National Material Handling Institute.

CONSULTING ENGINEERS DIRECTORY

Delos M. Palmer & Associates
Consulting Engineers
Electrical, Mechanical, Industrial
Processing, Plant Layout
Machine Design, Product
Development, Special Problems
Toledo 4, Ohio
733 Nicholas Bldg. GA. 3775

MATERIALS HANDLING ENGINEERING
By a group of practical engineers, thoroughly experienced in all types Materials Handling, in production as well as warehousing. Further information without obligation.
GEMAR ASSOCIATES
222 E. 46th St., New York 17, N. Y.

LANHAM FOR LIFETIME
THE STEEL BOUND SKID PLATFORM

with the RE-NU TOP

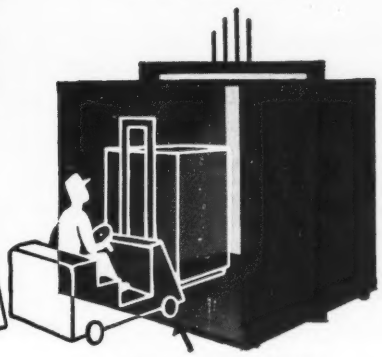
Renewable hardwood deck bound in heavy steel angles, clamped with ½" steel bolts. Can be used with all makes hand or power lift trucks. Designed to fit YOUR job with capacities from 500 to 20,000 pounds. Plain or armored ends. Stake pockets, crane hooks, special racks and bins available.

THE LANHAM COMPANY
12TH AND MAGNOLIA
LOUISVILLE 10, KENTUCKY

Change your thinking

about FREIGHT ELEVATORS for POWER TRUCK LOADING

500 LB. HAND TRUCK



8,000 LB. POWER TRUCK

It is necessary to change your thinking about freight elevators when you change from hand truck to power truck loading.

The reason? *Additional severe forces caused by industrial power truck loading!*

As illustrated above, a hand truck weighs about 500 pounds. Its pay load is relatively light.

Power truck loading completely changes this picture. A power truck may weigh 8,000 pounds, or more, plus its proportionately heavier pay load. It travels fast, stops quickly. It delivers its freight with a heavy impact . . . loads heavily off-balance . . . greatly increases the static load.

Obviously, power truck traffic can be handled safely only in freight elevators that have been specifically designed to take power truck 'punishment'.

FREE! A new OTIS Bulletin B-705H explains the forces imposed by power truck loading . . . shows how OTIS Pow-R-Truck Freight Elevators have been specifically designed to meet these stresses . . . gives platform dimensions and hoistway requirements for OTIS Pow-R-Truck Elevators with lifting capacities of 8,000 to 20,000 pounds. Your copy is ready. Address: Otis Elevator Company, 260 Eleventh Avenue, New York 1, N. Y.

Otis

STANDARDIZED
POW-R-TRUCK ELEVATORS

DESIGNED TO TAKE POWER TRUCK 'PUNISHMENT'

OVERHEAD CHAIN TROLLEY AND BELT CONVEYORS

"WE HID THE CEILING"

By J. F. BROWN, JR.
Production Engineer
Electrolux Corporation, Old Greenwich, Conn.

When you can't build, your headroom clearance may give you the equivalent of an annex. That's how Electrolux expanded—upwards—and tripled production without adding a square foot to its prewar assembly department.

OUR postwar conversion and postwar production expansion program can be summarized in the statement: "Do it now and keep it moving." With building additions practically impossible, we had to use our headroom in the assembly department to get the planned 300 per cent greater postwar output from practically the same space we used before the war. Cost and rapid buildup of volume were the vital factors to be considered at every step at the production planning stage. The selling price of the vacuum cleaners we produce has not been increased. It has remained unchanged since 1938. The greatly increased production meant full utilization of every square foot and cubic foot of space available.

This article describes the material flow factors pertaining to the main assembly of Electrolux vacuum cleaners, which are distributed by our company's own sales organization on a door-to-door basis.

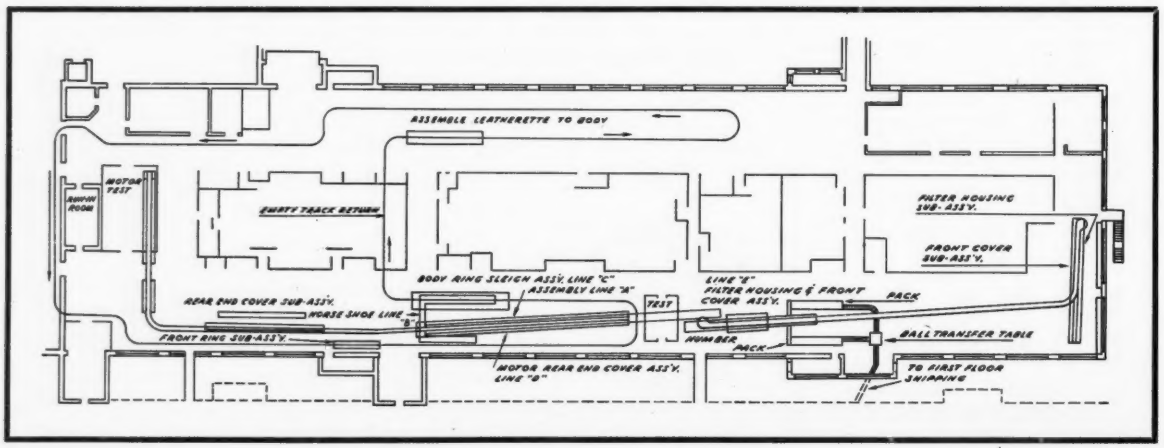
Maximum Production From Layout Essential

The final assembly department is on the second floor in the main building and there are three overhead feed-in conveyors to supply the five subassemblies used. Each of two overhead chain conveyors delivers two related components, and one line also carries a small piece part. The breakdown is as follows. Line C—bodies and rings; Line D—motors and rear end covers; and Line E—filter housings and front covers. The arrangement of these and the other lines involved is shown in the accompanying flow diagram.

The assembly starts at the west end of the room, where the bodies arrive on Conveyor C. The body is the cylinder of the machine. Painting, baking and other preliminary operations are performed in an area to the north of the main assembly operations.

As can be seen from the flow diagram, the body conveyor loops Assembly Line A in order to deliver the units at working level to the benches located on both sides. By referring to the section titled "The Supply Conveyors And Their Carriers", it can be seen that the work carriers for bodies also have two small hooks at the base. On these,

FLOW DIAGRAM shows integration of various overhead conveyors with main assembly line. All conveyors are identified in diagram.



two front rings are carried, one for each of the two bodies attached to every carrier.

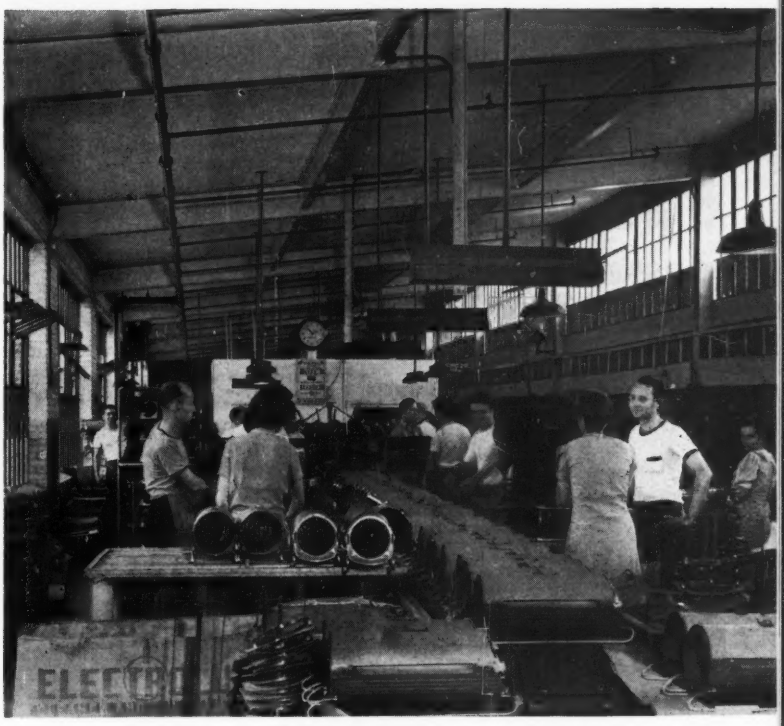
At the beginning of the assembly, the front ring and the sleighs are added to the body. The sleighs are runners on which the cleaner rides, while the rings are a part of the front end assembly. Small parts like the sleighs, as well as others, are brought to the line in suitable trays, racks and holders, depending on their shape. Supplies of these items are replenished on schedule.

As can be seen from some of the photos, the chain conveyor supply lines fill the cubic space so compactly that it is literally no longer possible to see the ceiling in much of the area. Space was a premium in a very special sense, the reason being that building was under government restrictions. Even if approval had been obtained, scarcities of various kinds would not have made a new building available to meet our expanding production schedule. The overhead lines serve as valuable storage facilities, freeing extra square feet of floor space in the adjoining subassembly department (where part of the material would have to be stored) for processing and assembly functions.

Vitalizing Conveyor Capacity

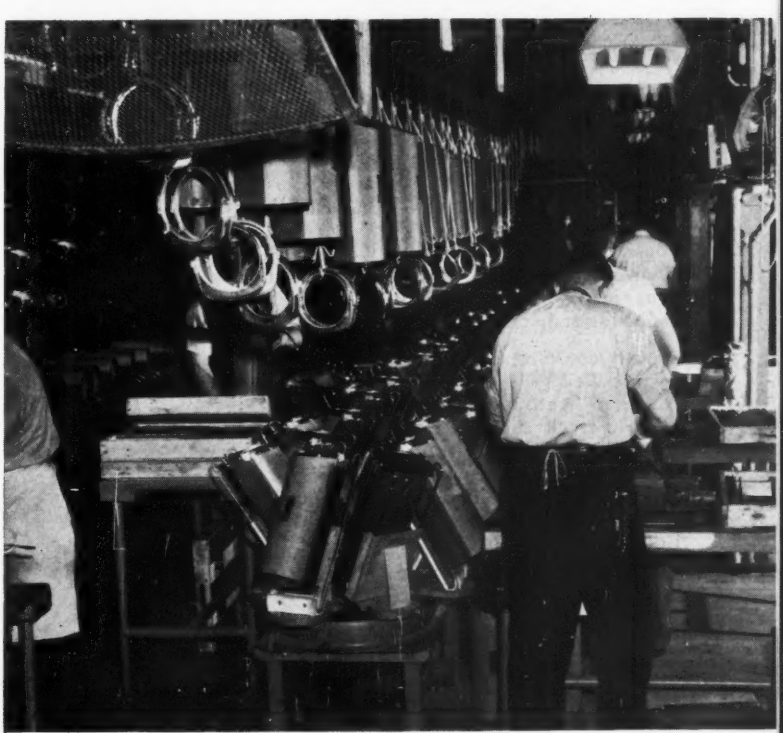
Another factor might be pointed out in connection with optimum utilization of conveyor capacity. With this aim in mind, the layout of the lines was given special attention. On the body conveyor, for example, the return line was placed so that it would leave the department at a point providing the shortest possible travel distance of empty hooks returning to the loading point. In other words, we took advantage of every possible means of taking material off the floor and keeping it circulating overhead.

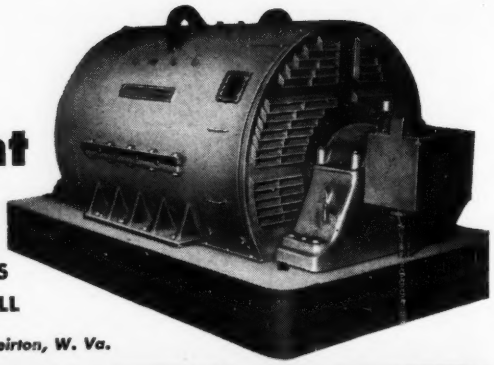
Another factor that had an imporant bearing on effective utilization of the conveyor capacity was the work carriers, or hooks. Special designs were made in accordance with the shape of the components to be conveyed. The design of each hook was determined with a twofold purpose in mind. 1. For maxi-



PREWAR start of assembly, with clear view of ceiling. It's hard to see in later photos.

POSTWAR. Bodies delivered by overhead line are put on hrose-shoe conveyor, foreground.

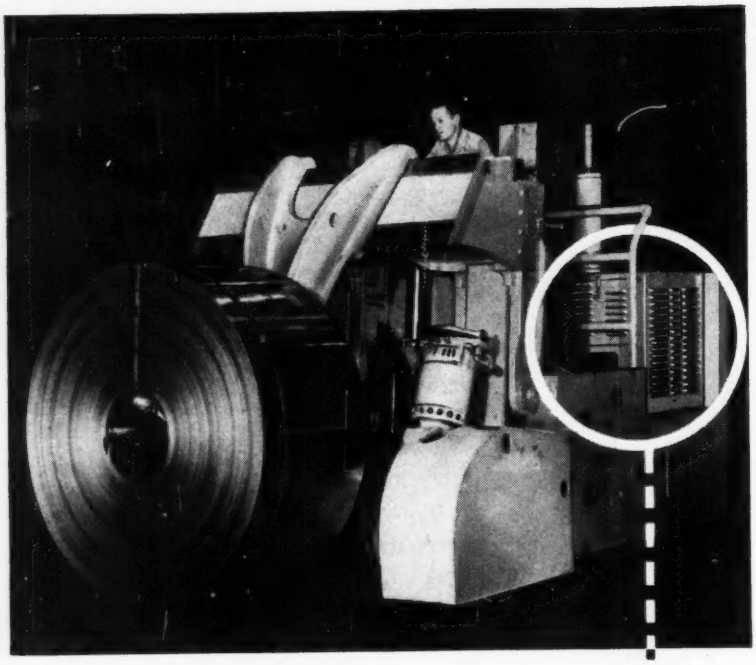




constant power

FOR THE WORLD'S FASTEST STRIP MILL

Weirton Steel Works, Weirton, W. Va.

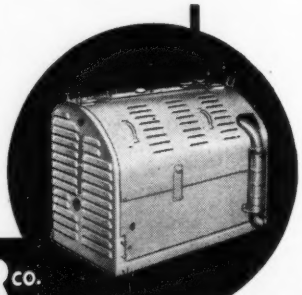


constant power

WITH READY-POWER-EQUIPPED ELECTRIC TRUCKS

Illustrated at top is one of two 2250 HP Motors at the Weirton Steel Works, Weirton, W.Va. furnishing *constant power* to drive the finishing rolls of the world's fastest cold-reduction strip mill capable of mile-a-minute production.

Equally constant and dependable is the power provided by the Ready-Power gas-electric unit on the "Automatic Skylift Giant" electric truck shown carrying one of the mill's 30,000 lb. rolls of finished strip. For electric trucks of any make or type, new or old, where constant power for hour-after-hour operation is needed—specify Ready-Power.



THE READY-POWER CO.

3826 Grand River Ave., Detroit 8, Michigan

mum conveyor storage capacity. 2. Protection of components whose surfaces or mechanisms had to be guarded against damage. The design of the work carriers used is described in detail in the separate section on the facing page.

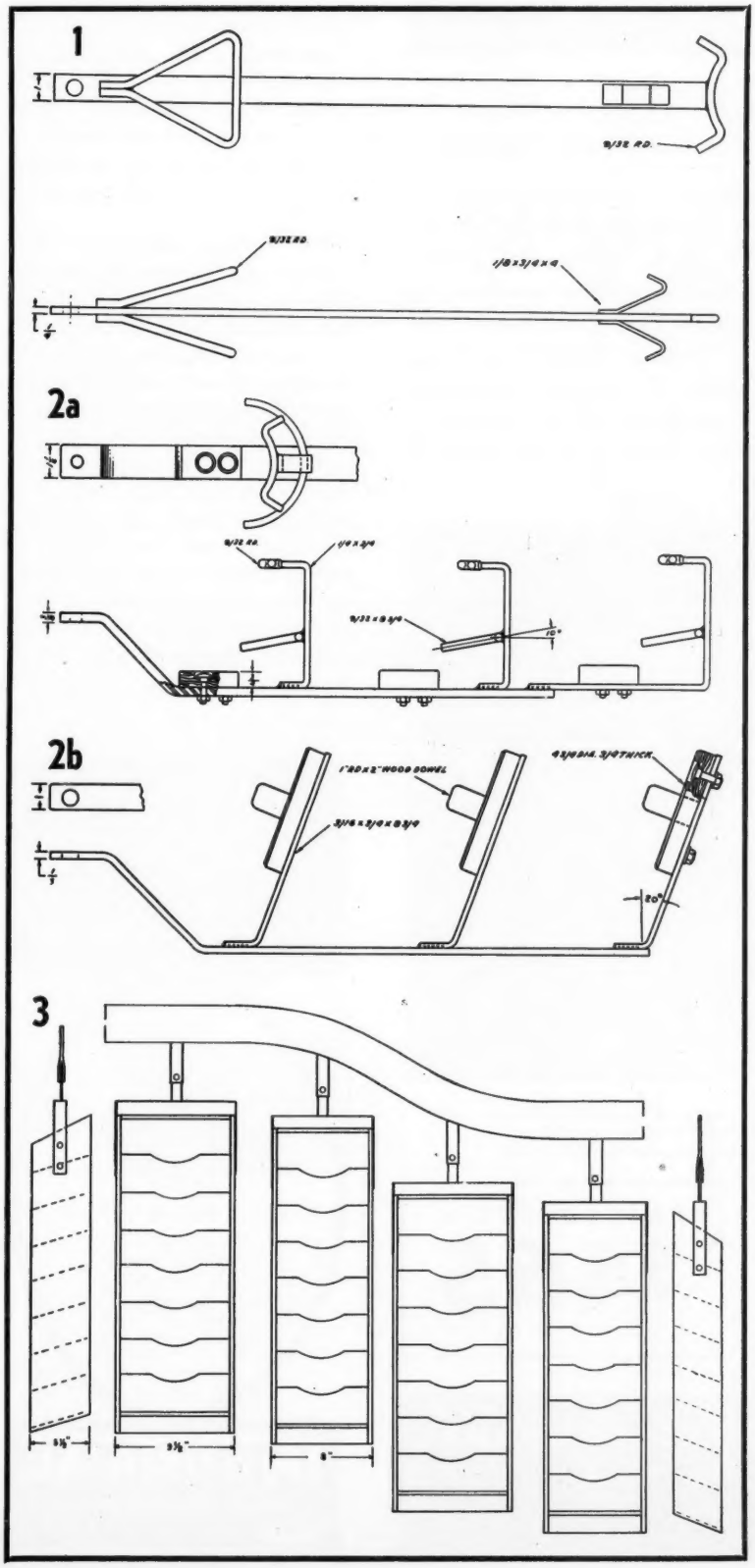
The Assembly Flow

After addition of the rings and sleighs, the operators dispose of the bodies on slanting holders, which travel at waist height on a chain-type conveyor having a horse-shoe shape (see photos). Reference to the flow sheet shows that the east-traveling assembly belt starts from within the horse shoe (line B). From the slanting holders of the latter (slanted for visibility and easy loading and removal), the bodies are removed by operators stationed on the south of the belt line. These operators tighten the bolts and deposit the units on the traveling belt. The conveyor runs on a 12-inch slider board, with a working ledge on each side making a total width of 32 inches.

The second battery of assembly benches is on both sides of the line, and two successive groups of assemblers are supplied by overhead Line D with two different components. Like the body conveyor, this line also circles in two parallel strands to feed both sides of the assembly belt. This conveyor circulates the motors and the rear end covers. (It extends from the run-in department located to the west of the assembly department). Each of the two types of components is hung on special carriers, which are spaced alternately on the conveyor, as follows. 1. A hook for motors which has three cradle-type fixtures spaced evenly on the vertical member suspended from the chain. 2. For rear end covers, a disk-and-pin type fixture, also three to each vertical member. The drawings of these and other work carriers are shown in the section mentioned previously.

After the motors have been assembled to the bodies, the operators replace the units on the belt for assembly of the rear end covers

THE SUPPLY CONVEYORS AND THEIR CARRIERS —



HERE are the details on the overhead supply conveyors and their carriers, described in the article on the facing page.

The body line (C) has a length of 906′ lineal feet, the line for motors and rear end covers (D) 493′ lineal feet, and the one for filter housings and front covers (E) 375 lineal feet. The carriers on all lines are spaced on 12-inch centers. Each line is driven by a 1 horsepower motor, with a variable speed range from 5′ to 30′ per minute.

1. The Body Line Carriers. The body is light in weight but somewhat bulky. After some experimentations, we arrived at the design reproduced here. It is a sleeve insert type carrier, one triangular holder welded to the top on each side of the vertical member (24-5/8″ long), which is suspended from the chain. This arrangement permits one body to be attached on each side. Since the ring is one of the first parts to be added to the body, it was desirable to design the same carrier for conveyance of the rings as well. The dual hook, welded to the base of the vertical member, was therefore included, as shown, one ring for each of the two bodies on the carrier. Thus the design not only gave us a carrier which would convey two units at a time, but also served for transporting another type of part.

2a. Line For Motors And Rear End Covers. As was mentioned in the main part of the article, this chain conveyor has two different types of carriers, one for motors and one for rear end covers, alternating on the length of the chain.

A. The carrier for motors is of the cradle-type, as shown, with three cradles mounted evenly in the vertical direction. The over-all length of this unit, from the drill hole to the base, is 30-1/8″. The cradle was designed to permit convenient grasp of the subassembly as well as easy removal with a rolling motion of the hand.

2b. The second work carrier (on the Body Line) with the pin-and-disk fixture is likewise shown. Like the motor cradles, these fixtures are spaced evenly on the vertical member. The fixture is a wooden one, to protect the chrome-plated finish of the end covers. The disk fits into a recess of the part, and the pin (which fits through a hole in the center of the cover) serves to retain it while being conveyed.

The vertical members of the carriers for the bodies and end covers are made of 1/4″ x 1″ band steel, those of the motor carrier of 3/8″ x 1 1/2″ stock. The reason is the heavier weight of the motors.

3. Line For Filter Housing And Front Covers. Because of their relatively fragile nature, finish and flat, circular shape, we decided on the cabinet-type carrier for these components. The two different cabinet widths are determined by the different widths of the items, 8″ and 9 1/2″, otherwise the cabinets constructed of 1/2″ lumber, are the same in every respect. Both are 5 1/2″ deep on the inside diameter.

The LOAD DISPATCHER

A REMARKABLE TRUCK
AT A REMARKABLE PRICE

The Load Dispatcher is adaptable to hundreds of material handling jobs around factories, foundries, warehouses, wharves, freight houses, etc., and will save time and money because of its unusually rapid and convenient handling. Its maneuverability and the ease of it amazes everyone who sees it for the first time. Nothing excels the Load Dispatcher for getting around where the going is tight. Its utter simplicity of design assures that it will require the very minimum of "time out" for attention and maintenance. From first cost on through its daily operation—fuel, labor, speed, maintenance—you will find that it contributes in full measure to economy of operation.

Load Dispatcher, one of a fleet of five saving its owners $100.00 per day, operating in a fertilizer factory with unusually cramped quarters for loading and transporting. Net load shown—2400 pounds.

You will be interested in the many unique, practical features of the Load Dispatcher. Write for catalog. *Some valuable territories open for distributors who can qualify.*

PRICED FROM
$465
F. O. B. INDIANAPOLIS

SCHWITZER-CUMMINS COMPANY
Material Handling Truck Division
1145 EAST 22ND STREET • INDIANAPOLIS 7, U. S. A.

at the stations directly east of this point.

With the attachment of the rear end covers, the units have traveled a little better than half the length of the final assembly line. Directly beyond the last-named assembly station, the units enter a testing room, where tests are made for voltage, lift, watts, etc., a 100 per cent check for all operating features.

The assembly belt—110 feet long—passes through the test room and extends 12 feet on its other side. Here the nearly assembled Electrolux cleaner is stamped with a serial number, and transferred. The distance to the packing station from this point is about 60 feet, and this is bridged by a second belt conveyor, a few feet to the east of the main assembly belt. The first belt could, of course, have been extended in a continuous line to packing. Here is why this was not done. All units to receive a serial number, must pass through the test booth. If the vacuum cleaners continued

5,000,000
IPCo PALLETS
Can't be Wrong!

WOULD YOU CARE TO KNOW HOW

IPCo

Pallets
give such phenomenal *added life hours* over all other Pallets?

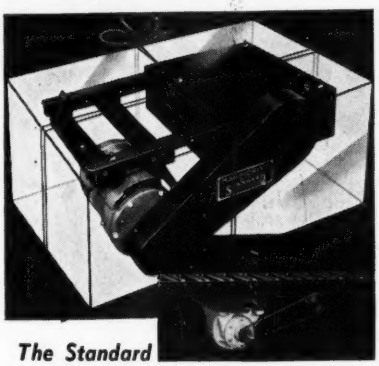
Then send for the interesting and helpful facts on Adding Life Hours to Your Pallets.

INDUSTRIAL
PALLET COMPANY, INC.
1819 Woolworth Bldg. New York 7, N. Y.

on the same belt there might be an excuse for finding an occasional unit stamped without a test. Use of the second belt requires a physical transfer from one line to the second. The job requirement calls for placing the units on the second belt directly after stamping. Hence there is no excuse for any omission, and proper assurance is taken that all cleaners will receive the required test and serial numbers.

The assembly remaining after test takes place is performed on the second belt line, and includes the addition of the filter housings and the front covers. These items are carried by overhead chain Conveyor D in cabinet-type carriers. As in the case of the supply line for motors and front end covers, this line also has a special carrier for each of the two parts, one alternating with the other along the length of the chain. Conveyor D, as can be seen, extends from the far east end of the department (where the subassembly stations for these parts are located). A vertical curve

New "POWER-PACKAGE" Unit For Roller and Belt Conveyors



The Standard

HANDI-DRIVE

This self-contained drive unit provides tractive power for any gravity conveyor—belt or roller. Converts present conveyors to live roller or belt—quickly at low cost. HANDI-DRIVE Bulletin No. FL-68 gives complete information—how to apply to present conveyors or plan new system with standardized units—straight, curves, or inclines. Write for copy today.

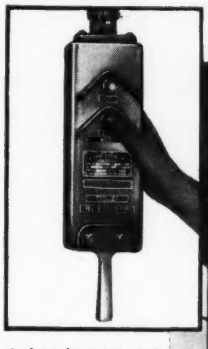
Standard Conveyor Co.
North St. Paul 9, Minn.

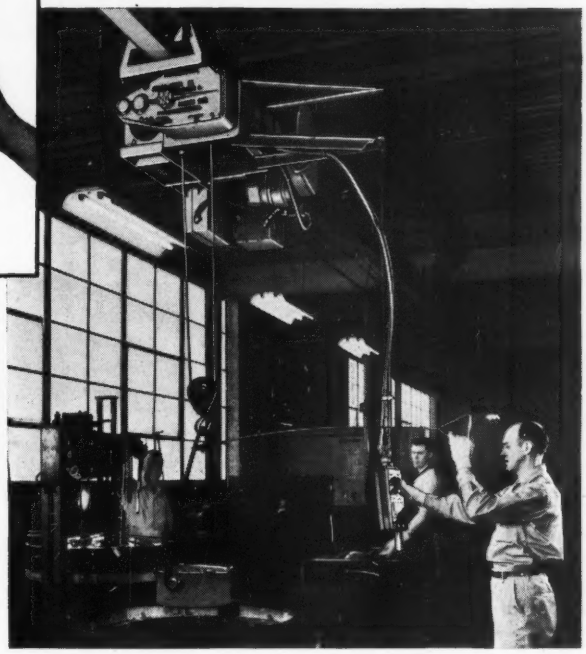
Standard

STANDARD HANDI-DRIVE BULLETIN

GRAVITY & POWER CONVEYORS

R&M *"Easy to use"* HOISTS SPEED WORK





A handy compact box permits one-hand control of lifting, lowering, and moving; leaves the other hand free for steadying or guiding the load. Illustrated: R & M Type FMDL motor-driven-trolley hoist.

Production speed hits a new high with Robbins & Myers electric hoists on the job. These handy "helping hands" are functionally designed—built to get work done. "We just couldn't get along without our hoist," says the superintendent of this modern midwestern heat-treat department. And that's the story everywhere. For R & M's are tops with owners and workers alike—they're so smooth, so easy to use, so dependable—and they put the skids under materials-handling costs!

MAKE LIFTING EASY IN ALL DEPARTMENTS

There's an R & M for every load, every location. Low headroom makes them ideal for low ceilings. Automatic, oversize brakes hold without "drift." Push-button, pendent-rope, or remote control—hook, lug, or trolley mounting—manual or motor-traveled. Powered by world-famous R & M motors. Sizes to 20,000 lbs. Maintenance? Negligible!

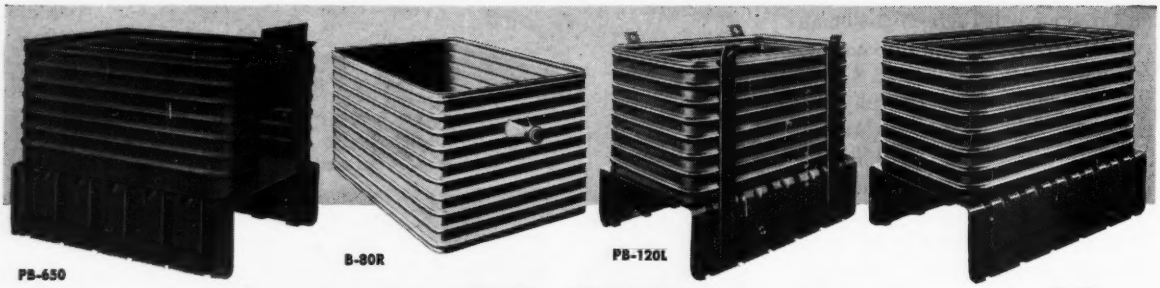
R & M'S CAN SAVE YOU TIME, EFFORT, MONEY

Owners everywhere are cutting costs, boosting profits with R & M hoists. Let an R & M specialist make a free analysis of your needs. His recommendations can help you to substantial savings. For full details and free literature, write today to the Hoist & Crane Division.

ROBBINS & MYERS • INC.

SPRINGFIELD 99, OHIO • BRANTFORD, ONTARIO

MOTORS • HOISTS • CRANES • FANS • MOYNO PUMPS



WIDE RANGE OF TYPES AND SIZES

Assures Efficient Truscon Steel Box Performance

● The need of your particular materials handling and storage operations can be met efficiently with one or more types from the many Truscon Steel Box and Skid models. These can be used for a wide range of parts or finished products, for quick, labor-saving movement by hand- or power-lift trucks or cranes. Let us give you the benefit of our experience in making materials handling and storage easier and more economical for you. Write for illustrated catalog on Truscon Steel Boxes and Platform Skids.

Standard Tote Box—One-piece drawn steel box manufactured from 16 gauge cold rolled steel. Used in handling miscellaneous small parts. Boxes are so designed that nesting is practical and easy. Dimensions: 12" x 18" x 6¼".

TRUSCON STEEL COMPANY

PRESSED STEEL DIVISION • 6202 TRUSCON AVENUE • CLEVELAND 4, OHIO

SUBSIDIARY OF REPUBLIC STEEL CORPORATION

CONE FEEDING TIME
Hungry stitching machines demand prompt attention to keep production lines whirring throughout several St. Regis paper-bag plants. A system using uniform sizes of Lewis Woven Wood-and-Wire Skid Boxes speeds and simplifies the movement of closing materials. Notice the spaciousness and neat, sturdy construction of Lewis Boxes . . . ideal for the protection of light-weight, bulky items that need fast, safe, efficient handling. Lewis Industrial Containers have solved many other materials-handling problems. Send for details.
G. B. LEWIS COMPANY
606 Mont. St. Watertown, Wis.
SKID BOXES
STACKING BOXES
SHIPPING BOXES
BOX TRUCKS
LEWIS
INDUSTRIAL CONTAINERS

LET
"George"
GIVE YOUR PRODUCTION A LIFT
The speed with which "George" picks up and hauls away loaded tote boxes, means greater efficiency in moving materials around your plant . . . increases output. A twist of the handle-bar sets hook in box handle, and pull-back glides load onto upper set of truck rollers. Lower rollers move truck to destination easily, quickly, without danger of strain or employee fatigue. Low cost . . . long life.
ASK FOR BULLETIN F
PUSH UP
HOOK UP
PULL UP
ROLL AWAY
LET "George" DO IT
TRADE MARK
ROLOCK INCORPORATED
FAIRFIELD, CONNECTICUT

over the assembly belt brings the parts to working level of the operators, one group removing the filter housings, and another group removing the front covers.

This line likewise circulates in two parallel strands, as do Conveyors C and D, in order to feed stations on both sides of the assembly belt. The units remain on the slowly traveling belt while these final components are added. At the half way point of this 60-foot line, the finish cleaning and final test operation are performed. Several feet east of this point the units enter the packing station. This part of the over-all operation is described in the Packaging Mechanics Section of this issue.

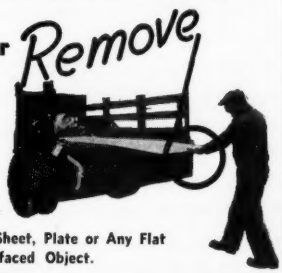
A Million Units in 20 Months

Production and material handling engineers visiting our plant have frequently remarked on the productivenesss of our compact layout and the material handling devices which we have built into it. But we at Electrolux do not fail to tell visitors about the obstacles we

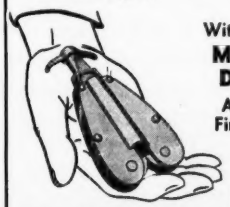
(Turn to page 62)

Convey

or Remove



A Sheet, Plate or Any Flat Surfaced Object.



With the New **MERRILL DUPLEX** Automatic Finger Grip.

It is only 3½" wide by 6" long, and weighs only 28 ounces. Everyone handling Sheets should have one in his hip pocket. It speeds up handling—Makes it easy.

Priced at $9.60 each. Ask your Jobber or Mill Supply Houses for them.

MERRILL Brothers

56-20 Arnold Avenue Maspeth, N. Y.

LEWIS-SHEPARD

MULTIPLY MANPOWER · LEWIS-SHEPARD · TRADE MARK

MATERIALS HANDLING EQUIPMENT

"Sign of a Great Line"

TRADE MARK of the widest line of completely engineered wheeled Materials Handling Equipment you can buy. Backed by 33 years' concentration in this field, these job-tested Lewis-Shepard products include . . . Electric and Gas Power Fork Trucks • Steel Bound Pallets • "JackLift" Electric Trucks • Hydraulic and Mechanical Hand Operated Lift Trucks • Skid Platforms • Hand and Electric Power Stackers • Storage Racks • Hand and Electric Power Cranes • General and Specific Purpose Hand Trucks.

MR. DOLLAR CONSCIOUS!

YOU SHOULD HAVE THIS CATALOG OF MATERIALS HANDLING EQUIPMENT THE KEY TO NEW PROFITS!

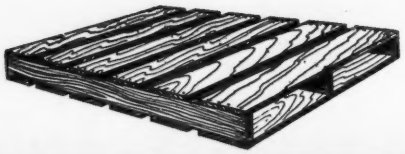
This 84-page book shows you how to apply our 33 years of experience to your business -- and make it pay off.

GET YOUR COPY TODAY!

LEWIS-SHEPARD PRODUCTS INC.

115 WALNUT STREET WATERTOWN 72, MASS.

REPRESENTATIVES IN PRINCIPAL CITIES — CONSULT YOUR PHONE DIRECTORY.

ON THE  PALLET

NEWS · VIEWS · TRENDS

SALES, service and engineering application of the newly developed automatic pallet loader will now be handled exclusively by the Lamson Corp., Syracuse. The equipment is manufactured by Production Aids, Inc., Van Nuys, Calif. The announcement was made jointly by the two companies. The machine automatically loads cartons from a conveyor to pallets, which are discharged to a roller conveyor for fork truck handling. The Lamson Corp. has 70 years of conveyor experience.

HERE'S another wonder of our age—mechanical "hands" which in dangerous radio-active areas perform delicate manipulations that range from operation of machine tools to lighting a cigarette and writing a name. The hands, similar to the double hooks used by amputees, were recently demonstrated by the General Electric Co. They are designed to extend over a protective wall into a radioactive area and to be operated by remote control. They are attached at the lower ends of two arms which descend vertically from two horizontal shafts.

PLASTIC foam insulating material, which combines exceptionally low thermal conductivity with very light weight, is now being produced by United States Rubber Co. for low temperature installations. Present applications include shipping containers for fresh and frozen foods, and commercial and home refrigeration in trucks, railroad cars, ships and airplanes. Because of the insulating properties of U. S. Flotofoam, walls in installations can be made thinner, thus increasing storage capacity.

AN estimated total of 13,600 persons registered at the AMA Packaging Exposition held in Cleveland April 23-26. It will take about six weeks for the edited lists to be issued to exhibitors.

BELIEVE it or not, radar is now applied to rats. A radar-operated trap first captures, then kills the rat electrically and ejects it. The deadly mechanism is set in motion when the rat enters an electrically charged field. The door of this trap is shut by an effect similar to that of the proximity fuse used in World War II. Seconds later the rat is killed in the death chamber. After the dead body is ejected, the doors immediately reopen for the next victim.

QUICK and effective sand core baking by means of a 3-kw dielectric heater was scheduled to be demonstrated by Allis-Chalmers May 3 to 7 at the 1948 Foundry Congress in the Philadelphia Municipal Auditorium.

TWICE as many conveyor belts are being produced now as in 1940, but they are still in short supply. The B. F. Goodrich Co. said the shortage is expected to continue for at least another year. The continuing shortage is attributed to the unprecedented demand by the high level of industrial activity and new uses.

ENGINEERS know that the proper solution to material handling problems lies in a correct engineering approach and cost analysis. No amount of mechanical equipment improperly applied will solve a material handling problem. In a great many instances the answer is a change in plant layout. In a general sense, there are two basic types of material handling. The first is the bulk, or mass, movement of materials over considerable distances for the purpose of transport to give it place utility. Into this category fall such movements of materials between widely separated buildings, between plants, or between producer and customer. The second class covers the movement of materials in the course of process. This type of handling as a rule is the more complex of the two, and takes on many different forms and conditions. It is also the one which contributes most to hidden costs. Considerable study has been given to the first type because it is out in the open and recognized. Too often the second type is glossed over as a necessary part of the processing operation. In recent years, through intensive study of operation analysis, we have found that a large portion of this handling is entirely unnecessary. What applied engineering effort has done for industry in the field of process improvement, methods improvement, new manufacturing techniques, or in a general sense, technological progress in the conversion of materials into useful products, it can also do for the handling of them.—*From an address before the Boston Material Handling Society, by R. W. Mallick, Westinghouse Electric Corp.*

How packaging time was cut 40%

Read how Acme Steelstrap and Acme methods help tool manufacturer cut packaging material costs 88%

The Multi-Shear Lawn Edgers pictured here are made by Appliance Manufacturing Company, Santa Ana, California.

Old cost for packaging six units was 27¢, with 5 minutes' packing time.

Then an Acme Shipping Specialist suggested the method of packaging you see here—two wood strips "Bound to get there" with Acme Steelstrap. Cost, 3¼¢; time, three minutes. Saving, 88%.

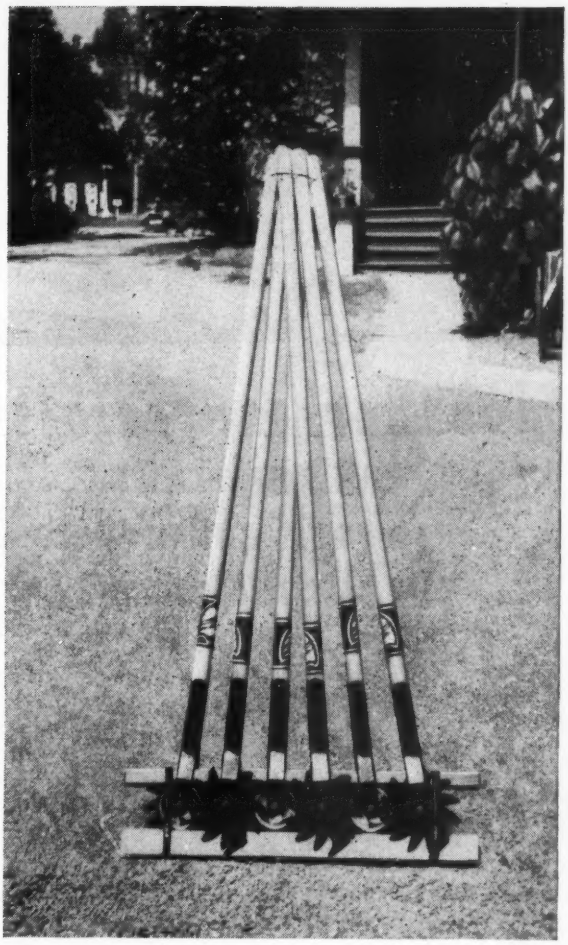
Pennies saved per packaging unit mean dollars on your books at the end of the year. Acme Shipping Specialists are ready to help you get them. For more information—and detailed case studies of how we have helped other companies—just clip and mail the coupon for the free booklet, "SAVINGS IN SHIPPING."

STRAPPING DIVISION

ACME STEEL COMPANY

Acme Steelstraps

NEW YORK 17 ATLANTA CHICAGO 8 LOS ANGELES 11



MONEY SAVING AND PRACTICAL—just three minutes is all it takes to package six lawn edgers with Acme Steelstrap for a saving of 88% over previous package cost.

Doc. Steelstrap

Acme Steel Company, Dept. F-68
2838 Archer Avenue, Chicago 8, Illinois

Please send me a copy of your case history booklet, "SAVINGS IN SHIPPING."

Name_____

Company_____

Address_____

City_____ Zone____ State_____

ACME STEEL CO.
CHICAGO

ROSS series - 5

INDOORS ---

and OUT!

— the pneumatic-tired lift truck that gives you greater handling economies!

Smoother materials-flow

- IN THE PLANT
- FROM BUILDING TO BUILDING
- THROUGHOUT PLANT YARDS!

Gives you the cost-cutting advantages of lift truck handling not only in your plant, but throughout plant yards as well. Easily handles capacity loads over all surfaces, in any weather.

Series 5 is *engineered* to give you the maximum benefits of pneumatic tires, based on ROSS' experience as pioneer exclusive manufacturer of pneumatic-tired lift trucks.

Series 5's cushioned ride eliminates driver-fatigue, protects loads from damage, minimizes costly wear and tear on floors, docks, roadways . . .

These advantages, plus Series 5's revolutionary tower design which permits 78% better visibility, are but a few of the reasons why it will pay you to investigate ROSS Series 5 Lift Trucks for your operations. Get all the facts.

Only ROSS SERIES 5 PERMITS 78% BETTER VISIBILITY!

Rely On ROSS

THE ROSS CARRIER COMPANY

280 MILLER STREET, BENTON HARBOR, MICHIGAN, U.S.A.

Direct Factory Branches and Distributors throughout the World

PALLETS

MADE TO YOUR SPECIFICATIONS!

From Air Dried Hardwoods

ALSO

BOX PALLETS
BULKHEADS
CRATES

Write and tell us your needs or send us your specifications for quotation.

Incorporated 1922

BIGELOW-GARVEY LUMBER CO.

326 W. Huron St. Chicago 10, Ill.
Phone: WHitehall 5252

MILLS: Arkansas - Georgia - Wisconsin Minnesota

SPEEDWAYS GIVE YOU More Time FOR PRODUCTION

AND SALES!

SPEEDWAYS save you time! You can save labor costs, too—by installing low-cost SPEEDWAYS GRAVITY CASE CONVEYORS . . . and you'll speed up production at the same time.

DOUBLE YOUR PRODUCTION WITH SPEEDWAYS "Y" FLIPSWITCH

The "Y" Flipswitch illustrated permits a double flow of materials—in either direction—by simply manually flipping the switch. Used in conjunction with standard 5' or 10' lengths (12", 15" or 18" wide) of Speedways sections.

Write for Speedways FREE new illustrated folder—No. 147.

KEEP 'EM ROLLING WITH SPEEDWAYS CONVEYORS, INC.

1242 Niagara St. Buffalo 13, N. Y.

Represented by experienced Material Handlers Equipment Handlers in principal cities.

DICO Float-Away BARL & DRUM TRUK

MOVES THEM EASY

STANDS ALONE

AMAZING Performance

One man handles heaviest drums all day with a "Float-Away" without usual fatigue. Unique in design—the wheels and axle never leave the floor when loading. Truck toes slide forward under barrel as carriage retracts to gently receive the drum. A light weight, perfectly balanced truck that never has to be lifted. Exclusive compression cylinder enables the truck to stand vertically—easy to store out of way—always handy. Unbreakable, adjustable chime hook for straight and bilged drums. Roller bearings, all metal or rubber tired wheels.

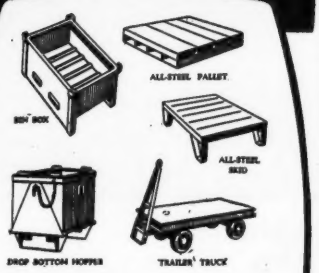
ASK YOUR JOBBER, or write DICO MFG. CO. Division

DICO CORPORATION

404 S.W. 16TH ST., DES MOINES 5, IOWA

Special Equipment

FOR THE EFFICIENCY OF YOUR MATERIALS HANDLING



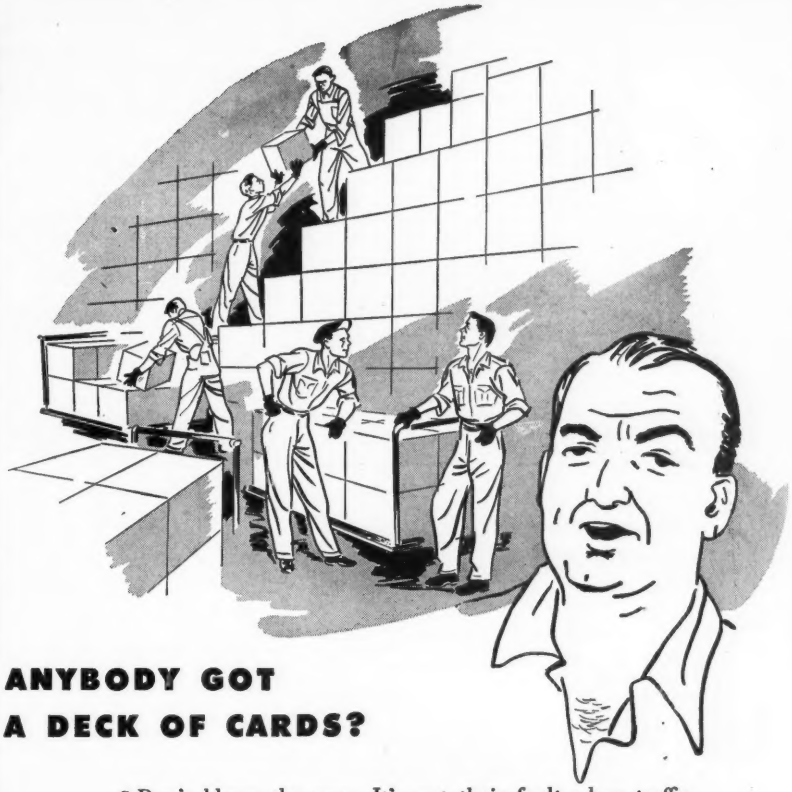
Designed and built to your specific needs, Fab-Weld **all-steel** equipment means top economy, strength and durability. Trucks, dump hoppers, skids, racks and bin boxes are examples of Fab-Weld geared-to-the-job engineering.

Write our Materials Handling Division for full details. Representatives in all principal cities.

FAB-WELD CORPORATION

RICHMOND STREET at PICKWICK

PHILADELPHIA 34, PA.



ANYBODY GOT A DECK OF CARDS?

● Don't blame the men. It's not their fault when traffic gets jammed on a stacking job. It's just one of those things . . . one of those losses that puts a dent in the production-profit curve.

You don't have to take this loss. Two men . . . one at each end of the line . . . can quickly handle an entire conveying and stacking job with *Rapid-Wheel* Gravity Conveyor* and a *Rapid Power* Booster.* And there won't be any traffic jams or slow downs, either. Think what that would mean in your production picture . . . and your profit profile.

Hundreds of things are produced for less today because of Rapids-Standard Material Handling Equipment. We'd like to show you how it can be applied to your business. Write today . . . there's no obligation.

THE RAPIDS-STANDARD CO., INC., 377 Rapistan Bldg., Grand Rapids, Michigan

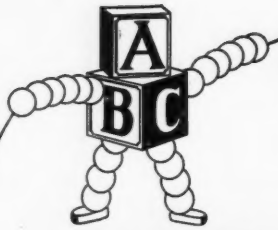
Your local Rapids-Standard representative is listed in your classified telephone directory.

*T. M. Reg.

IT'S WISE TO CONVEYORIZE

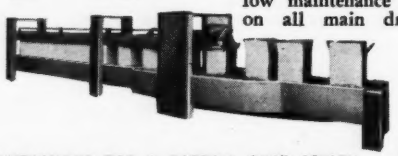
Rapids-Standard

MATERIAL HANDLING EQUIPMENT

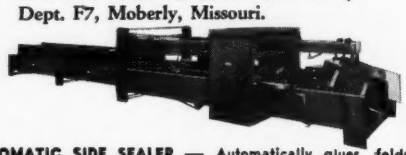


COMPLETE LINE OF CASE SEALERS

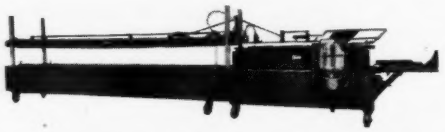
Case sealing operations can be done faster — more economically with an A-B-C machine. Features of A-B-C machines include simple, sturdy construction for minimum down time — low maintenance cost; ball bearings on all main drives; geared head motors. A-B-C specializes in building packaging machinery exclusively. Take the "hand" out of handling. Let an A-B-C specialist help solve your case sealing problems. For details write A-B-C PACKAGING MACHINE CORP., Dept. F7, Moberly, Missouri.



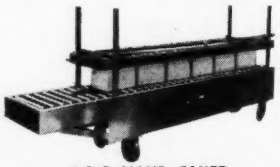
A-B-C AUTOMATIC TOP & BOTTOM CASE SEALER — Automatically glues, folds and seals either or both top and bottom flaps of cases in one operation.



A-B-C AUTOMATIC SIDE SEALER — Automatically glues, folds and seals either or both ends of cases too long and narrow to be accommodated in an upright position.



A-B-C SEMI-AUTOMATIC BOTTOM CASE SEALER — Seals bottom flaps in one operation. Handles empty cases with partitions in place. Speeds up to 15 cases per minute.



A-B-C HAND GLUER
A motor-driven compression unit for the setting of hand glued cases. Automatic starting and stopping switch. Easily portable.

A-B-C

PACKAGING MACHINE CORP.

MOBERLY, MISSOURI

OTHER A-B-C PRODUCTS
Automatic Top Sealer • Automatic Side Sealer • Semi-Automatic Bottom Sealer Hand Gluer • Glass Container Case Packer

FIG. 16-24
Two-Wheel Trucks for Every Use

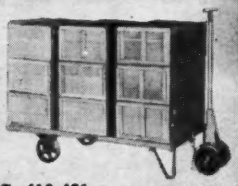
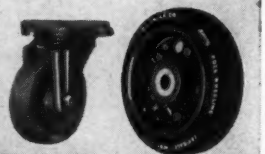


FIG. 419-421 Jack and Live Skid



Casters, All Types, Light, Medium, Heavy Duty

Wheels with Demountable Rubber Tires

Ask Nutting Engineers

FOR ADVICE ON MATERIALS HANDLING

FIG. 1136
One of Many Sizes and Styles of Bar Handle Platform Trucks

NOW is the time to Engineer your Materials Handling

Your materials handling system needs to be just as carefully planned and engineered as your production set-up, or the design of your products. A planned layout may well be the difference between profit and loss, between smooth-flowing operation and a time-wasting series of bottlenecks. Take advantage of the seasoned experience and valuable advice of a Nutting Engineer. Because the all-around adaptability and versatility of Nutting Trucks has never been excelled, he can advise you on the proper use of trucks with overhead or floor conveyors . . . assembly or production line use . . . interdepartmental use . . . warehouse or shipping room use . . . as well as situations where only trucks should be used.

LOOK in your *Classified Telephone Directory* to contact your nearest Nutting Sales Engineer, or write to us direct. Ask for Bulletin 48-G.

Over 1000 Nutting Designs

56 years of specialized, continuous experience in building materials handling equipment is embodied in the Nutting line for your benefit. We supply every need in floor trucks, casters, wheels—including specially designed trucks for specific needs.

NUTTING TRUCK & CASTER COMPANY

1602 DIVISION STREET WEST, FARIBAULT, MINNESOTA

our 57th Year

PACKAGING MECHANICS SECTION

A regular monthly section in which are presented solutions to the problems of efficient filling and handling the boxes, cartons, bags, bottles, cases, etc., used in commerce and industry.

CONTENTS

Packing Geared To High-Volume Production—every Electrolux cleaner is packed and shipped from end of assembly..... 50

Improved Crating Produces Shipping Savings—motors from one to 20 hp. are packed in (a) corrugated containers, (b) wirebound crates, (c) wooden boxes..... 52

Wax Cools On Way To Packing—a 17-lane conveyor table does the job..... 54

Packing Geared to High-Volume *Production*

By J. F. BROWN, JR.
Production Engineer
Electrolux Corporation, Old Greenwich, Conn.

WITH tens of thousands of Electrolux vacuum cleaners coming off the lines every month, their packing and disposal was considered and planned as an integral part of the over-all operation. (The assembly of these units is described in a separate article in this issue.) With no intermediate storage provided, the cleaners are packed and routed to shipping as quickly as they arrive from the assembly department.

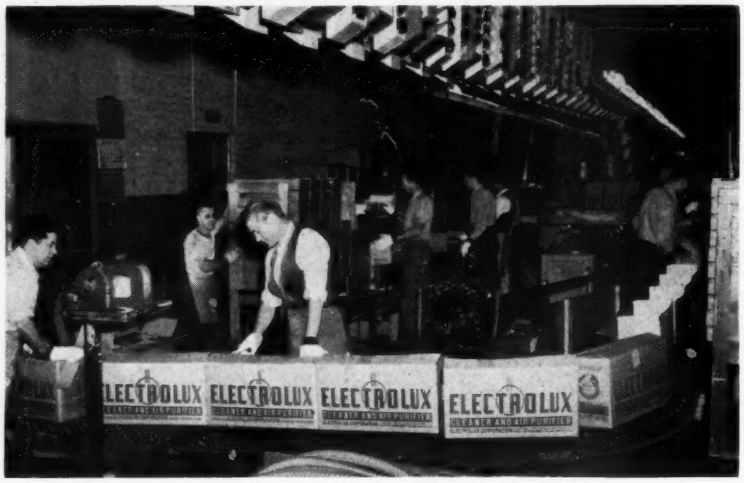
This balance between production and packing is maintained with (1) dual layout in the packing department, (2) specialization of functions on the part of the packing operators, and (3) by use of a continuous conveyor system to the shipping department on the ground floor.

The assembly belt conveyor extends into the packing department (as was mentioned in the article on the assembly operation). A limit switch at its end point shuts down the line, which travels eight feet a minute, when vacuum cleaners reach its far end. Theorotically, movement is intermittent, but it is a matter of pride to the packing group to maintain uninterrupted belt travel.

The belt conveyor extends five feet into the department, dividing the packing area into two equal longitudinal sections. A packing station is on each side (north and south), making the cleaners accessible to operators at both sides of the dual layout.

Where the line enters the department, it passes under a shelf installed at a height of 12 inches above the canvas belt. This shelf is used for the carton supply operation. An operator on the north side of the layout sets up the carton flats and the units are fed to the packer on each side.

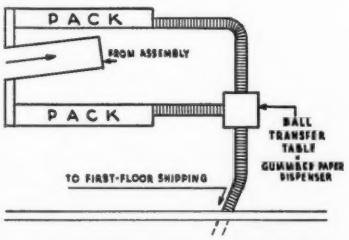
Here is a breakdown of the packing operation. The arrangement is, of course, the same on each side of the dual layout. Operator No. 1 deposits the vacuum cleaner into the carton, which has been positioned in a chute before him. We have installed a chute at this point (rather than a flat carrying surface) because the chute walls serve to pin the carton flaps down, thus giving the operators a clear opening and free access to the containers.



ELECTROLUX PACKING. Dual packing lines converge at dispenser for gummed sealing tape.

The operator next in line, Packer No. 2, adds various corrugated cardboard baffles, which are of course the "cushion" between the cleaner and the accessories that follow. The packing supplies mentioned are directly in front of each operator, on castered shelf racks spotted parallel to the line on both sides of the layout. This arrangement is shown in one of the photos. The stock, by the way, is withdrawn by the packers from one side and replenished from the other side. Thus any interference is prevented.

The job performed by Packer No. 3 is as follows. After he has slipped a protective corrugated sleeve over the chrome-plated end of the hose, he adds the latter to the box. Because of its length, the hose is the only item not supplied from the bins flanking the packing lines. These accessories are supplied in a castered three-sided bin spotted in the center of the packing floor, where the material is readily obtainable by the operators on either side.



LAYOUT SKETCH of dual packing lines which are shown in the photo above.

Packer No. 4, the last one in the line, adds two wrapped "wands" (suction tube extensions), cords, and other small accessories, also an illustrated instruction booklet.

The carton has now arrived at the end of the chute, which is adjoined by a pitched length of grav-

ity roller conveyor. The containers shunted on these sections arrive on a ball transfer table. This is a checking station where a final visual inspection is made for proper packing. The operator stationed here seals the carton flaps down with a gummed strip of paper supplied by a dispenser on a stand.

The cartons travel a few feet south over a gravity line into a chute that leads to the ground-floor shipping department. On the first floor, the containers arrive on a gravity roller line, which is paralleled on each side by 20-foot sections of the same type of conveyor. On these last-mentioned lines larger corrugated shipping containers are positioned to receive three of the smaller cartons containing individual cleaners with their accessories. (The bulk of the units are shipped three-to-a-carton to our districts, from where they are sent to our branches. Units destined for nearby locations are usually shipped in single-unit cartons.)

The full three-unit containers are shunted over a gravity roller line through a stapling machine. Beyond it, the completed units are palletized for movement to the

LOADED CONTAINERS arrive at top stitcher. Fork truck, rear, moves loads to trucks.

adjacent truck shipping doors. The shipping department is located at the east end of an extensive (supply) storage area, and the fork truck used here is an important

(Turn to page 56)

WITH THE 3000 POUND PAY LOAD

truck-man pallet toter

Ever figure costs, per ton, of horizontal material movement with a truck that weighs as much as twice its own payload? Wasteful! That's why we designed the Truckman PALLET TOTER; payload, *3000 pounds and more* — weight 920 pounds, ready for action! It incorporates the same dependable power turret you found so successful in Truckman Model D Hydraulic Lift Truck and Truckman Platform Utility. It's agile, rugged, simple to operate and maintain. It has scores of features important to you, including:

- **Nationally known Wisconsin gasoline engine, famous for faithful service...**
- **Hour-after-hour efficiency—no battery charging lay-ups or equipment costs...**
- **One-lever control of clutch and brake. Powerful hydraulic fork lift...**
- **Rubber insert load wheels to soften jolts, pneumatics for driving traction...**
- **Safe, comfortable, untiring handling by operator who *rides with the load*...**
- **Well balanced design, heavy welded construction, ready for hard service.**

To top all this, your Truckman PALLET TOTER is available for $850, f.o.b., Jackson, complete, including 48" forks. And you can put it to work without buying a single "extra." Yes, this is your answer where costs count: PALLET TOTER, a light, economical unit for horizontal movement of pallet loads. Write for our new Model DF Bulletin—or the name of our distributor in your area.

$850
F.O.B. JACKSON

Ask Any Operator Over 70 Truck-Man distributors in principal cities provide standard service.

truck-man INC.
1418 West Ganson, Jackson, Mich.

Improved Crating Produces Shipping Savings

Specific figures are given on savings in container cost, freight charges, and assembly time. Packing efficiency is the subject of continual study at Reliance.

SIZABLE savings in shipping cost and other worthwhile economies are being chalked up by the combination of improved materials and simplified techniques now employed in packing electric motors of from 1 to 20 hp. at the new Ashtabula Division of The Reliance Electric & Engineering Company.

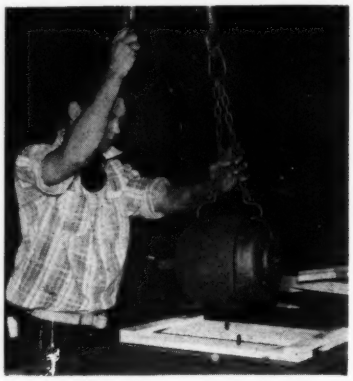
In this new motor-manufacturing plant along the shores of Lake Erie, shipping containers of three different types are used—corrugated boxes, wire-bound crates and standard wooden crates. Each in its place is called upon to play an essential role in performing product-packing operations economically.

The particular type package to be used is determined by the size of the motor to be shipped. The smallest motors produced here (1 to 3 hp.) are packed in corrugated containers, 5 to 7½ hp. units in wire-bound crates, and the remaining larger sizes up to 20 hp. in conventional wooden crates.

Planned Packing Production

The entire packing sequence followed, like the flow-line which has been established for the production of motors in this new Reliance plant, capitalizes as much as possible on the efficiencies inherent in the straight-line principle of conveyorization. Physical effort is held to a minimum as two jib hoists located at each end of the packing line take care of all heavy lifting requirements.

Spray-painted with a quick-drying, synthetic gray enamel as the last operation prior to packaging, each motor is mounted on a wooden base and placed on a roller conveyor line which runs past the spray booth to an area centrally located between the shipping dock and the finished products storage section. (See the flow diagram.)



ELECTRIC HOIST spots all motors on packing conveyor line. See the next photograph.

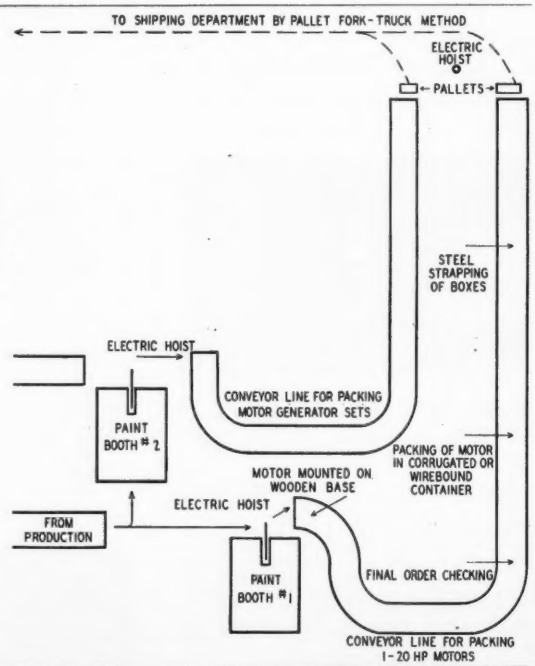
This equipment stands waist high, enabling operators to pack and crate motors in the line of horizontal travel.

The smaller motors, fastened with carriage bolts to the wooden bases, have packing cartons dropped over them. The loaded carton is then turned over, the one open side closed and the whole strapped with four No. 16 high-tensile strength wires. Motors are handled and shipped in this up-side-down position. A fork lift truck is used to transport them on pallets from the end of the line to the warehouse for vertical storage or to the truck-loading platform for immediate shipment.

Thorough Tests Made

The feasibility of packing motors of from 1 to 3 hp. in corrugated

NOTE ELECTRIC HOISTS at start of both packing lines. Electric hoist also loads packed motors on pallets at end of two lines.


TO SHIPPING DEPARTMENT BY PALLET FORK-TRUCK METHOD
ELECTRIC HOIST
PALLETS
STEEL STRAPPING OF BOXES
ELECTRIC HOIST
CONVEYOR LINE FOR PACKING MOTOR GENERATOR SETS
PAINT BOOTH #2
PACKING OF MOTOR IN CORRUGATED OR WIREBOUND CONTAINER
MOTOR MOUNTED ON WOODEN BASE
ELECTRIC HOIST
FROM PRODUCTION
PAINT BOOTH #1
FINAL ORDER CHECKING
CONVEYOR LINE FOR PACKING 1-20 HP MOTORS

containers was established by Reliance only after a series of exhaustive tests had been conducted

CORRUGATED CONTAINER is placed over smaller motors from one to three horsepower.

in conjunction with various container manufacturers. From these trials which involved tests with some 20 different corrugated boxes, the present sturdy, special-purpose container has been adopted as the standard package for motors of this particular classification. First tried out in the company's Cleveland plants in July, 1946, this type of packaging was continued in use at Ashtabula when the latter plant opened a few months ago.

Measuring 21½ inches long, 14½ inches deep and 14½ inches wide, the carton is of two-wall construc-

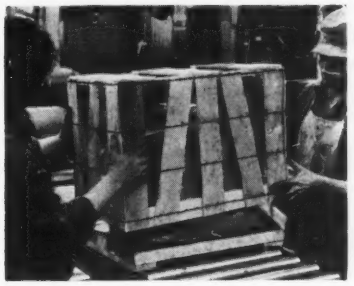
A SECURE PACKAGE is made with the application of No. 16 high-tensile strength wire.

tion, so designed that it incorporates an interior liner held away from the outer wall by four corrugated corner posts. These posts support the base to which the motor is fastened and thus provide a cushioning effect to withstand shocks and jolts encountered in transit.

A drop test was the first in a series of experiments to determine

PACKAGING MECHANICS SECTION

whether such containers possessed sufficient strength to make them suitable for use in shipping motors.



WIRE-BOUND CRATE is dropped over larger motors. Moistureproof bag keeps out the dust.

In this test each corrugated box loaded with a motor was dropped from a height of 20 feet in such a fashion that it would land on a corner. Excessive corner crushing, splitting of carton seams and damage to end brackets of motor were some of the principal difficulties

(Turn to page 55)

HOIST GRABS

When Ordering:

- Order by Item Number.
- Prices are F.O.B. Los Angeles.
- Prices subject to change without notice.
- Weights are approximate and may vary slightly.
- Deliveries are made from stock on hand at time order is received.
- If dealer cannot supply you—order direct.
- Inquiries for special equipment should be accompanied by a rough sketch including all pertinent data.

Write for Bulletin No. 200 covering these and many other items.

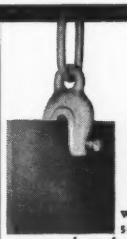
DOWNS CRANE & HOIST CO.
MECHANICAL ENGINEERS
540 W. VERNON AVENUE
LOS ANGELES 37, CALIF.

Electric Cranes ● Hand Cranes ● Jib Cranes ● Sheaves ● Sheave Blocks
Plate Grips ● Plate Hooks ● Crane Trolley Hoists ● Crane Wheels ● Crane
End Truck Units ● Jib Crane Fittings ● Automatic Mechanical Load Brake
Crane Hook Blocks

SAFETY PLATE GRIPS

A non-slip grip to handle steel sheets, plate, pipe, structural shapes and open top barrels or drums in vertical or horizontal position.

Item	Cap. Tons	Handles Plates	Weight	Price
382	½	0" to ⅜"	13 lbs.	$18.00
383	2½	0" to ¾"	40 lbs.	$26.00
393	3	0" to 1 "	50 lbs.	$36.00
384	4½	0" to 1½"	84 lbs.	$39.00
385	8	0" to 2 "	153 lbs.	$73.00



SCREW PLATE CLAMPS

A reliable clamp with hardened set screw for erecting structural steel, tanks, etc. Also for lifting and positioning steel plates at bending rolls, brakes, shears and similar processing operations.

Item No.	Cap. Pounds	For Plates Up to	Weight	Price
411	5000	1 "	25 lbs.	$32.00
412	5000	1½"	27 lbs.	$25.00
413	5000	2 "	29 lbs.	$29.00

DOWNS BEAM TONGS

Here's standard equipment for plants handling or processing steel beams and girders: A fast, safe means of moving flanged sections in vertical or upright position.

Item	Cap. Pounds	Max. Beam Flange Widths	Weight	Price
420	1½	5"	10 lbs.	$16.00
421	3	8"	40 lbs.	$40.00

DRUM CHIME TONGS

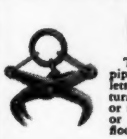
Handles steel drums 18" to 24" diameter in upright or vertical position. No adjustments to make—simply slide jaws in or out to drop over rim of drum and lift. Self-equalizing grip.

Item	Cap.	Jaw Opening For Drums	Jaw Opening For Chime	Price
245	750	18" to 24" dia.	⅛"	$28.00

SPUR PAD BOX HOOKS

Here's a grab to handle boxes and crates of all descriptions. Ease your handling problem with Downs Spur Pad Box Hooks and Slings.

Item	Capacity	Reach of Pad Hooks	Weight	Price
-30	1000	5 feet	26 lbs.	$33.00
-52	2000	5 feet	40 lbs.	$42.00



PIPE TONGS

Tongs for handling heavy pipe, bundled bar stock, billets, bars, castings and steel turnings. Pick up a bundle or a single bar from a pile—or lift bar stock directly off floor without blocking under.

Item	Cap. Tons	Size Pipe or Round Stock	Weight Each	Price
365	¾	1" to 3½" O.D.	26 lbs.	$24.00
366	1½	2" to 7 " O.D.	58 lbs.	$36.00
369	3	5" to 13 " O.D.	150 lbs.	$98.00

PLATE & BEAM HOOKS

Handle plates, beams, or other structural material in horizontal or flat position with these Hooks. Tapered opening causes hooks to wedge tightly on edge of material for a non-slip grip. Slot in lower lip permits hook to straddle web of beam for lifting sections from ends.

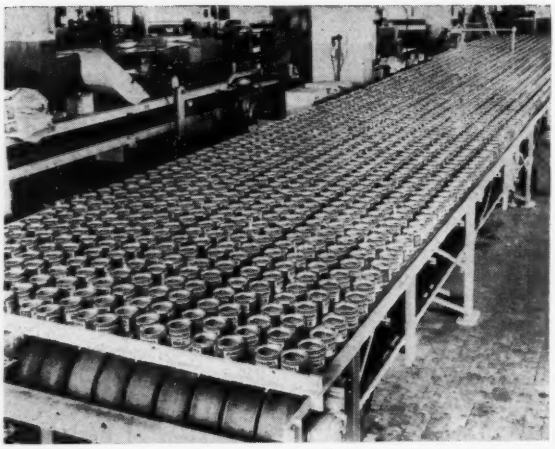
Item	Cap. Pounds	For Plates Up to	Weight	Price
464	1500	1 "	7 lbs.	$ 6.00
465	3000	1¾"	21 lbs.	$11.00

DOWNS CRANE & HOIST CO.

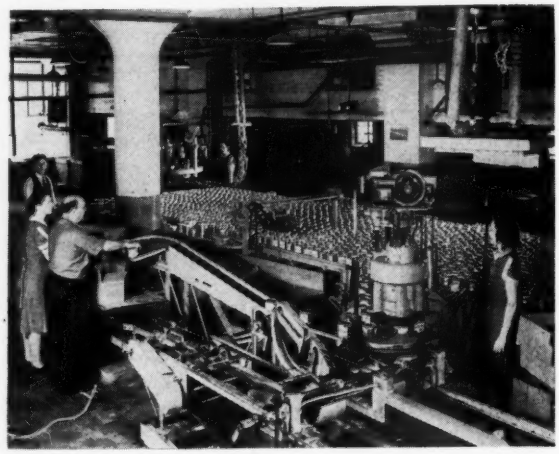
Wax Cools On Way To Packing

PACKAGING MECHANICS SECTION

S. C. Johnson & Son, Inc., Racine, Wisconsin, packs millions of one-pound and two-pound cans of paste wax. The material is in a liquid state while being poured from the piston-type filling machines into the containers and must be cooled properly to obtain the right degree of solid consistency before packing.



The company has solved this problem with the conveyorized cooling table shown, a 17-lane belt line. The empty cans are fed through a slide from an upper floor to the filling machine, which fills 72 containers per minute. A narrow conveyor belt advances the

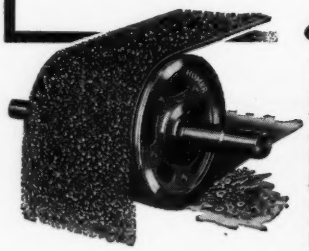


"First year—saved $600 in shipping room," say users of Marsh Stencil Machines, Brushes, Inks! WPB, railroads, truckers recommend stenciling. Easy to use, three sizes to meet Gov't Spec., 1", 3/4", 1/2. For sample stencil, shippers' handbook and prices, pin this to business letterhead, with your name.

MARSH STENCIL MACHINE CO.
67 Marsh Building
Belleville, Ill., U. S. A.

MARSH
STENCIL MARKING

Homer PERMANENT
MAGNETIC, NON-ELECTRIC
Separators



Homer permanent magnetic pulleys offer you the most in protection against tramp iron infiltration into finished products or expensive machinery. Employing powerful Alnico magnets, Homer Permanent Magnetic Pulleys range in size from 12" to 24" in dia., with widths to 60". Homers handle burden depths from 2½" to 8" depending on material.

Plate type magnetic separators, single or triple gap, standard or hinged mounting are available for all types of tramp metal separation. Standard widths range from 4" to 26". Special sizes available. Cast aluminum deck furnishes complete self-insulation. Cast aluminum cover shields powerful Alnico assembly against dust and moisture. No wires or electrical accessories necessary

PRODUCERS OF MAGNETIC SEPARATOR EQUIPMENT SINCE 1923
The HOMER Manufacturing Co., Inc.
DEPT. F-11
LIMA · · · OHIO
PERMANENT MAGNETIC SEPARATORS — PLATE TYPES AND PULLEYS

filled units from the machine to the start of the first of the 17 five-inch belts, 50 feet long, which make up the carrying surface of the table.

The drive is supplied by a 1 1/2 horsepower motor at each end, with the belts traveling at the rate of 32 F. P. M. As a can reaches the end point of one line it is pushed by those traveling behind it against a curved plate. This plate serves as a transfer device that moves the units over to the next belt which travels in the opposite direction. The cans of wax are thus conveyed over the 17 adjoining belts, and in the meantime they are subjected to cool air supplied from a turbine-type blower at one end as well as from several overhead fans. The particular table shown holds 2250 one-pound cans when all lanes are solidly filled.

As the containers travel longitudinally on the 50-foot-long table (north to south), they also move in a west-to-east direction across the width of the table as they are successively transferred from one adjoining belt to the next.

It takes approximately 30 minutes for a can to complete the total travel distance, and by that time the liquid wax has solidified into a mass of the desired consistency. Midway on Belt No. 17, the arriving cans are shunted by a deflecting arm to the capping machine, also shown in one of the photos, whose capacity balances that of the filling machine. As can be seen, the sealed containers are delivered to a narrow take-away belt which delivers to the packing table. Its sloping surface both positions the containers for convenient handling by the operator as well as for easy removal with a sliding motion into the corrugated shipping container.

SAVINGS FROM BETTER CRATING . . .

(Continued from page 53)

encountered with sample cartons before the present satisfactory container was developed.

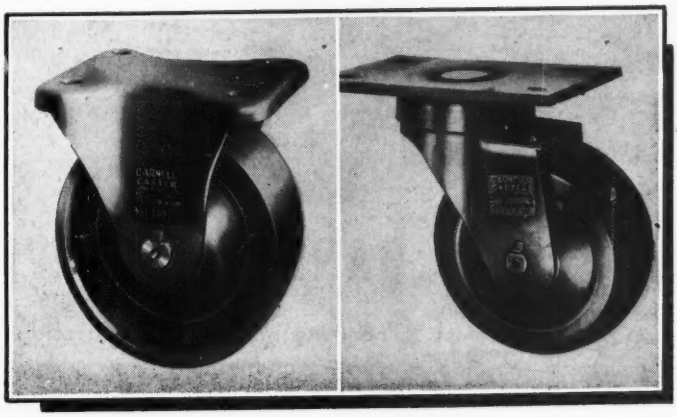
An impact test also was used to determine the degree of sturdiness of a carton. In this test, a loaded corrugated container was released from varying heights on an inclined 35-foot roller conveyor to be carried by gravity for progressively greater distances before being brought to an abrupt stop against a wall built of two-by-fours at the end of the slide. This treatment simulated that which such packages are likely to receive in rail transit when cars are being shunted about in yard switching movements. Here again, the carton adopted as standard withstood material damage, whereas many others tried were badly battered from the impact against the wooden stop.

Two savings have been achieved

with the improved carton. One is the reduction in freight charges because of a decrease of approximately 20 per cent in shipping weight over the weight of the heavier crates formerly used. The second is a saving of about 40 cents in the cost per container. Considering that well over 1,000 of these containers are used every month in

DARNELL

Casters & Wheels



Darnell Double Ball-Bearing Casters and E-Z-Roll wheels reduce floor wear to a minimum, lengthen the life of equipment and increase the efficiency of employees—Write for 192 page Darnell Caster and Wheel Manual.

DARNELL CORP. LTD.,
LONG BEACH, CALIFORNIA,

60 WALKER ST., NEW YORK, N.Y.
36 N. CLINTON, CHICAGO, ILL.

Reliance's Ashtabula plant, these two economies add up to an appreciable sum. Greater ease and speed of handling are other benefits.

Wire-Bound Crates for Larger Motors

With 5 to 7½ hp. motors weighing on an average from two to three times more than 1 to 3 hp. motors, a container of greater rigidity to handle this greater weight is necessary to satisfactorily protect these motors. In this case, too, through the use of wire-bound crates, several economies are effected over the wooden crates previously employed.

According to W. E. Mulholland, shipping foreman at the Ashtabula Division, savings in crate weight range from 12 to 15 percent—with savings of as much as 50 percent the time required to assemble the crates.

Material costs likewise are reduced, with wire-bounds taking only 24 nails for assembling a crate as compared with 64 needed with standard wooden units. This means that these particular motors receive protection against damage in transit and at lower cost than formerly.

Standard wooden crates are still used for packing motors of the very large sizes. However, Reliance is now working closely with suppliers to develop special wire-bound crates which will enable such motors to be packed for shipment with economies corresponding in degree to those now obtained with both corrugated and wire-bound containers.

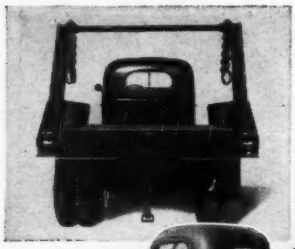
While packing problems may vary widely from one plant to another to meet individual conditions, the main objectives of simplifying packing procedures and economizing on costs are commonly shared by all manufacturers. At Reliance these problems are under continual scrutiny. Results of the efforts already made are viewed as highly encouraging, but as company executives look at it, the challenge to reach still higher standards of packing efficiency remains an incentive to further study of the problem.

HIGH-VOLUME PACKING

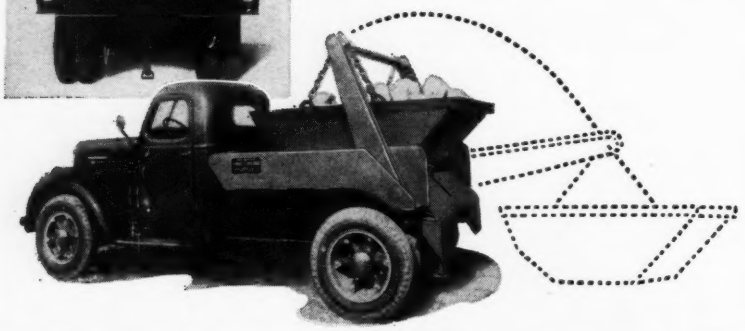
(Continued from page 51)

labor-aiding machine, making possible the rapid transfer of the cleaners to the outbound vehicles without physical effort. This is particularly important since our space does not permit a depressed truck dock. The fork truck elevates the pallet loads from the grade-level platform to the truck beds, eliminating a strenuous lifting job that had to be done previously through physical effort.

This is how we keep our packing-shipping department geared to the high-volume assembly operation. What is produced, is packed and shipped. ●



No other Equipment as VERSATILE!



MATERIALS HANDLING SOLVED

● When it comes to handling materials easier, faster, cheaper — no other equipment of this type can compete with the Brooks Load Lugger system of loading, hauling and dumping. You can install a flat bed Brooks Load Lugger on any standard truck and use it with 10 to 30 detachable truck body containers, thus keeping your men busy always loading while your trucks are always hauling. Or, you can set container down on the ground or in the plant, and presto — you have the same truck as before, ready for general hauling purposes! Whether you deal in solids, liquids or dust — Brooks engineers can design a system of containers to solve your particular materials handling problem. Capacities — 1 to 10 cu. yds. Write for free catalog.

Brooks

BROOKS EQUIPMENT & MFG. CO.

702 DAVENPORT RD., KNOXVILLE 1, TENN. U. S. A.

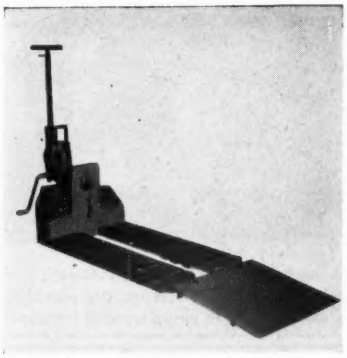
LOAD LUGGER TRADE MARK REGISTERED

LOAD LUGGER DAY PULVERIZER CANE LUGGER

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13.

PALLET TRUCK WITH WINCH

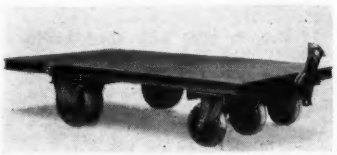
1—A hydraulic pallet truck fitted with winch and ramp is being manufactured by the LYON-Raymond Corp.



This equipment is designed for cases weighing up to 6000 lbs. The load is drawn up the ramp and on the truck's carrying surface by the use of the winch and 15 feet of steel cable. In storing the load, the truck is elevated four inches, and wheeled into position, with the overhanging sides of the case over blocks. The load is then lowered on the supports. The ramp is hinged and easily removed.

HEAVY DUTY TRAILER

2—The Mercury Mfg. Co., Chicago, is announcnig a new 15,000 lb. capacity all steel industrial trailer. A caster steer vehicle, it is suited for



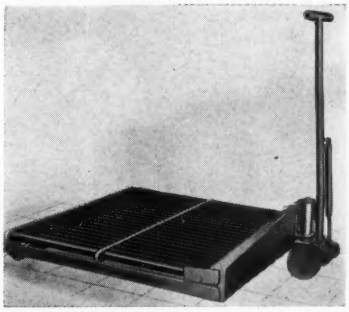
handling such heavy loads as machinery, dies, etc. The trailer is equipped with three heavy duty swivel casters for steering control and two wide faced load wheels. All five wheels have pressed on solid rubber tires and antifriction bearings. Platform sizes and types of hitch can be furnished to meet individual requirements.

ROTATOR DRUM TRUCK

3—A portable Rotator drum truck has been introduced by the Morse Manufacturing Co. The Rotator will accommodate drums up to 55 gal., and will rotate a maximum drum load of 500 lbs. at speed up to 50 rpm. The model is designed for mixing paints, oils, and thinners; making adhesives and plastic compounds; tumbling and cleansing small parts; cleaning inside of used drums, etc. Portability facilitates easy loading and unloading of drums, which can also be completely drained while mounted.

PALLET SWITCHER

4—The LYON-Raymond Corp. has developed a truck with a roller bed. The unit is designed for moving pal-



letized loads from a freight car or truck to a conveyor. The truck is lined up with the conveyor and the pallet load is rolled off for delivery to the warehouse floor. The equipment is designed to handle the standard 48" pallet and loads up to 4000 lbs. Hinged stops are provided to retain the pallet during transport. The handle is furnished with a self-contained holdup device.

LOAD-GRAB

5—The Hyster Co. has introduced an attachment, the Load-Grab, for use with its models "20" and "40" lift trucks. Designed for palletless materials handling, it has a capacity of 1780 lbs. on the model "20" and 3350 lbs. on the model "40". According to the company, the Load-Grab arms will squeeze-grip bales of cotton, rags or wool, cartons or boxes, or drums or barrels. The steel arms are operated

CUT MAN-HOURS SAVE MONEY ON MATERIAL HANDLING WITH

"Weld-Bilt" PRODUCTS
WEST BEND EQUIPMENT CORP. WEST BEND, WIS.

You'll move materials faster, at lower cost with WELD-BILT "job-engineered" equipment! Call on your nearby "Weld-Bilt" representative for money-saving suggestions.

Weld-Bilt Pallet-Type Hydraulic Lift Truck

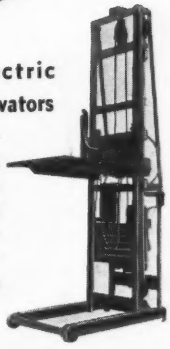
"Palletizing," with Weld-Bilt Pallet Trucks, shows amazing savings in many plants.

Weld-Bilt Hydraulic Lift Truck

Easier-handling, longer-wearing, with HORIZONTAL Hydraulic Unit. To 10,000 lbs. capacity.

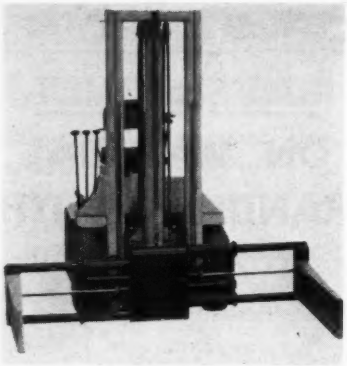
Weld-Bilt Electric Portable Elevators

Improves storage efficiency. Single, double telescopic, hinged types, motor or hand operated. Capacities, 500 to 4000 lbs.



Write for catalog and details—also on Weld-Bilt Platform and Two-Wheel trucks, Skid Platforms, Tiering Machines.

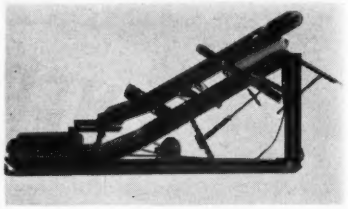
WEST BEND EQUIPMENT CORP.
241-5 Water St., West Bend, Wis.
Materials Handling Engineers



and hydraulically controlled from a lever in the driver's seat. They spread from a minimum 17″ to a maximum 62″ on the "20" and 66″ on the "40", and can be lowered to within six inches of the floor.

BAG FLATTENER

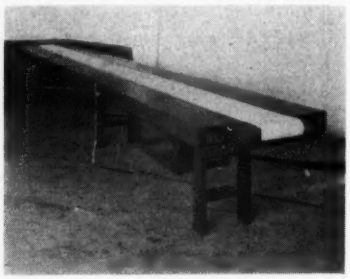
6—The Flexoveyor Bag Flattener has been developed by the Flexoveyor Manufacturing Co., Denver. Power driven by an electric motor, it is designed to eliminate air from the bag and evenly distribute the contents, thereby producing a smooth bag which piles easier, stays piled better and occupies less floor space. It is further stated that due to the rocker arm connection between the hugger boom and lower



conveyor, a "kneading and pressing action" is applied by the hugger boom.

PORTABLE CONVEYOR

7—Conveyor Specialty Co. is marketing Unitable, belt conveyors designed to production schedules. It can be lengthened or shortened by addition



or omission of intermediate sections and can be moved from one location to another. Side counters can be added

Divine STEEL WATE

PRESSED STEEL - SWIVEL or RIGID

TRUCK CASTERS

A new caster of exceptionally strong, inexpensive design, to provide safe, efficient running gear for industrial trucks, without danger of failure under overload. Single ball race swivel, with rigid to match. Both formed from heavy gauge steel with reinforcement at the axle for added strength.

STEEL WATE Swivel Caster with Alloy Iron Wheel and Thread Guard

STEEL WATE Rigid Caster with DuRock Wheel and Thread Guard

- ✓ General dimensions conform with established standards for interchangeability.
- ✓ Precision ball bearings operate in large diameter, full-formed raceway.
- ✓ Steel spanner bushing over the axle provides improved bearing surface and added rigidity to the caster legs.
- ✓ Parkerized black oil finish to all exposed metal parts prevents rust.

Divine Brothers Company

UTICA 1, N.Y., U.S.A.

HANSEN TACKERS

WITH

LABELS and tags can now be tacked on boxes, crates, barrels —with greater precision and speed —with the Hansen Tacker with its *Balanced Drive* feature.

Easy to grip, with short handle travel, Tacker remains in perfect balance thruout each gripping of handle. Saves effort. Conserves time. Lessens fatigue.

Made in thirty-six different models, Hansen Tackers and Staplers offer a wide selection from which to choose. Staples for these units are made in eighty lengths and widths. A model for every tacking and fastening purpose.

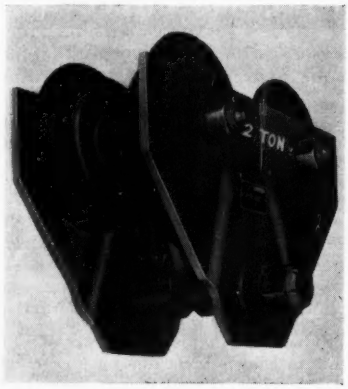
A. L. HANSEN MFG. CO.

5010 DAVENWOOD AVE. CHICAGO 40 ILL.

to one or both sides of the conveyor line as required.

CHAIN HOIST TROLLEY

8—The Saginaw Products Corp. offers a new chain hoist trolley for use on I-beam overhead conveyor installations. Wheels are fabricated of heavy strip steel, and are said to hold lubricant while excluding dust and grit.



Standard grease fittings are supplied for positive pressure gun lubrication, and deep flanges prevent climbing the track. Heavy sideplates extend past wheels, acting as bumpers, and are self aligning to distribute the load equally on all four wheels. The two halves of the trolley are adjustable to permit mounting at any point on the I-beam.

BARRELL SKIDS

WAR SURPLUS — NEW REFINISH

10 FT. NEW HARDWOOD SKIDS	$13.50 Each
List Price $22.50 Each	$144.00 Dozen
12 FT. NEW HARDWOOD SKIDS	$15.00 Each
List Price $27.50 Each	$160.00 Dozen
10 FT. NEW METAL SKIDS	$13.50 Each
List Price $24.50 Each	$144.00 Dozen

Platform Trucks, Trailer Hitch Type for Dock Use. 48" Wide, 84" Long, 12" Steel Wheels with Roller Bearings. Weight 250 Lbs. Cost New Over $200 Each to Government. Price $30.00 Each.

COMPLETE NEW MATERIAL HANDLING EQUIPMENT.
SHIPPING ROOM SUPPLIES.

Write for Free Catalog

ALAMEDA DISTRIBUTORS

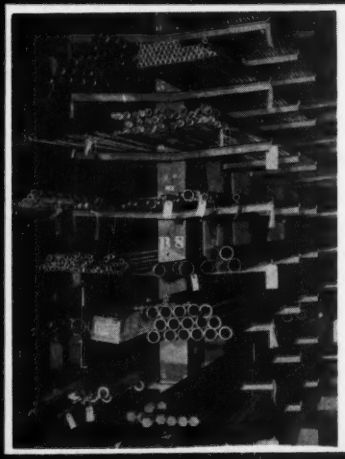
1926 EVERETT ST. ALAMEDA, CALIF.

The
"LITTLE HUSTLER"
TRANSFERS STAMPINGS
AS FAST AS PRODUCED!

The "Little Hustler" is fully portable and quickly adjustable to a wide range of applications. The 8 foot size shown above has a maximum delivery height of 81 inches at 45° and 50 inches in a horizontal position. Made in 13 models: 4-6-8-10 and 12 ft. long, by 12", 18" or 24" wide. Also special sizes. Send for circular LHC. We design and manufacture permanent conveyor systems and all types of SPECIAL EQUIPMENT.

MAY-FRAN
ENGINEERING, INC.
Development Engineering and Manufacturing
1710 Clarkstone Rd. Cleveland 12, Ohio

POSITIVE SAVINGS!



Pictured is a typical Rack Engineering Company custom-built T-Rack. Our engineers will design the best rack for your requirements. Our factory will give you the best in construction. For particulars write Department 101, Pittsburgh, Pa.

RACK ENGINEERING COMPANY
MATERIAL HANDLING ENGINEERS
PITTSBURGH, PA.
CHICAGO PHILADELPHIA DETROIT

FREE-ROLLING
LONG LIFE,
LOW MAINTENANCE

Fig. 760
1-Bar Handle

Fig. 753
4-Wooden Stakes

Fig. 762
2-Pipe Stakes

WITH

HALLOWELL

TRUCKS
of
STEEL

Fig. 772
1 Rack

Fig. 751
4-Pipe Stakes

Fig. 757
2-Bar Handles

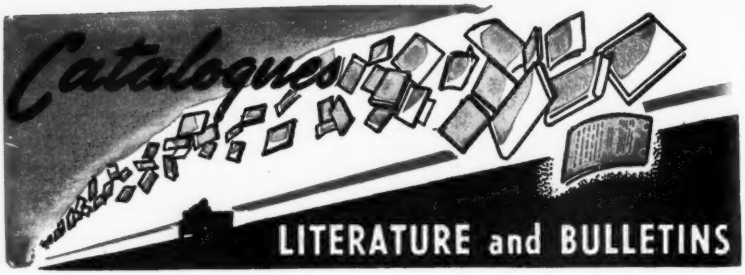
They're built to stand up for years against gruelling punishment . . . and their sturdy, welded steel construction insures against weak, loose joints and wobbly trucks. Free-rolling wheels and casters run easily, even under heavy loads. There are many types and styles —a few of which are shown—*each* a model of smooth-running durability—available for almost *every* service. Ask now for your copy of the "Hallowell" Catalog—it describes them all.

OVER 45 YEARS IN BUSINESS

STANDARD
PRESSED STEEL CO.

BOX 799, JENKINTOWN, PA.

Branches: Boston, Chicago, Detroit
Indianapolis, St. Louis, San Francisco



The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

25—Non-Electric Magnet . . . The Eriez Manufacturing Co. offers a new bulletin on how to remove tramp iron non-electrically from heavy loose flowing materials. These include coal, rock products, paper slurries, grain, bulk foods, chemicals, etc. The magnet's general use, strength, and construction are covered in detail.

26—Case Unloader and Unscrambler . . . A four-page pamphlet is offered by A.B.C. Packaging Machine Corp. Progressively ilstratde,(T ycul Corp. Progressively illustrated, it shows action photos of its case unloader and unscrambler machine. Designed for the packer whose containers are received chine empties the cases, unscrambles packed in re-shippable cases, the mathe empty containers, and delivers them to the filling line in single file. The unit is adjustable to cartons ranging in sizes from 6″ x 6″ x 3″ up to 16″ x 22″ x 14″.

THOMAS
PRY
TRUCK

Easy, Fast, Safe
For Big Loads

Loads of freight too big or too heavy for regular 2-wheel trucks can be handled easily with Thomas Pry Trucks, particularly when used in pairs. Sharp steel nose slides under load, tremendous leverage enables user to easily raise load as high as 9″ from floor. Used by freight handlers on RR, trucks, docks and in mfg. plants. Made in 3 sizes. Capacities up to 5000 lbs.

Purchase
in Pairs

Many purchasers use Pry Trucks in pairs. Two men can tackle a mountain of freight, too big or too bulky to handle with anything else manually, and quickly, easily move, shift, load or unload.

Thomas Truck
& Caster Co.

4865 Mississippi
River,
Keokuk, Iowa

27—Line Marker . . . A bulletin by the Newaygo Engineering Co. on its New Way Floor Marker. Features of this model are: no spray nozzles, pumps, valves or hose attachments. It and is designed to operate with any has a 4 to 5 gallon capacity paint tank, kind of paint or lacquer.

28—Packing Short Cuts . . . A manual available from Sherman Paper Products Corp., manufacturers of Corroflex. This is a cushion-packing material, flexible enough to be used as a "wrap around" container. Many practical suggestions are given concerning efficient, economical packing practices. The manual points out that this material has made possible savings up to 60 per cent.

29—Pipe Conveyors . . . Hapman Conveyors, Inc. announces a 39-page catalog, covering its pipe conveyors and accessories. Included are engineering drawings of typical systems for flour, dust, coal, sand, lead chips, and sludge handling. Pictures and sketches are also included, plus capacity charts illustrating adaptability and performance.

30—Imprinting Machine . . . A catalog available from The Weber Addressing Machine Co., manufacturers of tag and label addressing machines and imprinting devices. Information is given on four of its models which are designed for marking directly on surfaces or for use with stencils. Special uses of each model as well as specifications and general descriptions are included.

31—Storage Batteries . . . A new 16-page, fully illustrated brochure by the Gould Storage Battery Corp. offers data to storage battery users. The brochure features: Raw materials specification and testing; Instantaneous voltage measurement; Complex metallic compound analysis; Crystalline structure of cast lead; and Proving products of research.

32—Chain Stock Drive . . . Morse Chain Co. has issued a catalog describing specifications, service factors and classifications and installation data of the new stock drives. Installation and maintenance of silent chain drives are covered along with type and size of drive cases to be used on certain installations.

33—"Pak Tyer" . . . . Illustrations and descriptive material on its package tyer are given in a catalog released by the Paul L. Karstrom Co. Its various uses are featured, and cost and time saving data are given.

OPPORTUNITIES

Men wanted Jobs wanted Lines available

Rates: for "Positions Wanted" $3.50 classificaitons $3.50 minimum for 25 words, each additional word 10c; bold-minimum, limit 25 words. For all other face type or all capitals, $6.00 minimum for 25 words, each additional word 15c; limit 50 words. Box addresses counut os five words. All insertions are payable in advance.

MATERIAL HANDLING SALES ENGINEERS

Nationally known manufacturer of material handling equipment is searching for competent sales representatives. Must have mechanical or electrical experience and practical knowledge of material handling methods.

Several productive territories available Write for personal interview. Box 538, Flow.

USED EQUIPMENT WANTED

WANTED
USED MATERIAL HANDLING EQUIPMENT
We buy FORK LIFT TRUCKS
Gasoline or battery driven
Gravity Conveyors, Hand Lift Trucks, Pallets, Cranes

A & A MACHINERY CORP.
1267 Flushing Ave., Brooklyn, N. Y.

FOR SALE

FOR SALE: 6 - 10′ sections Lamson roller conveyor, perfect condition. These sections are mounted on Lamson carriages, equipped with casters and connections. Rollers are 24″ long x 2″ in diameter on 4″ centers. We can also furnish one or two 45° curves. Price is right.

KING STORAGE WAREHOUSE INC.
Erie Blvd. at South West St.
Syracuse 1, N. Y.

FOR SALE: Brand new Yale and Towne K M 30-2M center control fork truck — complete with Carlisle and Doughty Battery and Electric Products fully automatic generator for charging battery. This equipment has never been used. Offer subject to prior sale. Address inquiries to SHELLMAR PRODUCTS CORPORATION, Mount Vernon, Ohio. Attention Purchasing Department.

For Sale Motowlift-3500 lb. hydraulic lift gas truck. Has had light duty—in operation now. Box 6148.

POSITION WANTED

SUPERVISING ENGINEER: Thoroughly experienced in materials-handling surveys and application; broad knowledge of indirect operations, procedures and co-relation with direct production. Desires permanent affiliation permitting growth and offering future. Box 6248, Flow.

July Issue Briefs

Modern chip disposal in an old plant . . . mechanized material flow in a cigar factory . . . bag filling in a fertilizer plant . . . methods engineered for high packaging production of a complex package of pharmaceuticals . . . designing a pallet operation in a metalworking plant using hundreds of different items . . . how a straddle truck operation eliminated the costly use of railroad cars and highway trucks. Watch for these articles in early issues of FLOW.

SHOP MULES serving 73 industrial fields . . .

No wonder Shop Mules earned their high reputation as "America's Most Versatile Industrial Tractor." Inside or out, for any type of plant, their low operation and maintenance is in addition to remarkable maneuverability and dependability. Those powerful 22 H. P. International Harvester engines, 66″ turning radius, pneumatic tires and world-wide, fast International Harvester parts service add up to an unbeatable value.

Just tear out this ad and send today with your name and letterhead for impressive service evidence and detailed specifications.

SHOP MULE INDUSTRIAL TRACTORS

W. F. HEBARD & CO.
CHICAGO 9, ILLINOIS

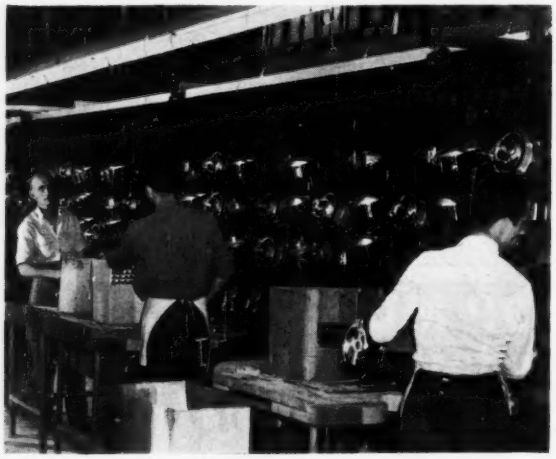
CREATORS AND MANUFACTURERS OF SHOP MULES SINCE 1918

WE HID THE CEILING . . .
(Continued from page 43)

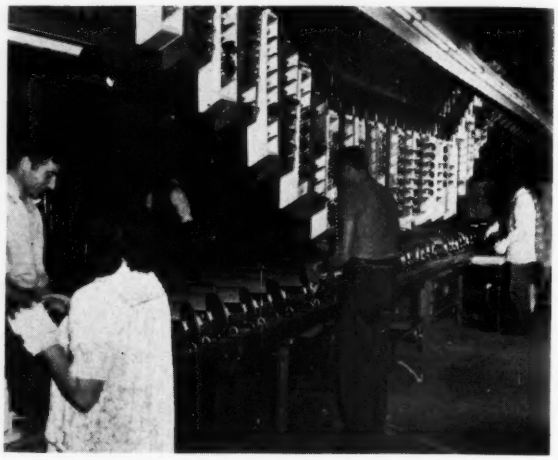
had to overcome in setting up the schedules, laying out the operation and making the installations.

We had been on war production exclusively until VJ Day. Within three days, by August 17, 1945, we had received cancellation of 95 per cent of our war production. A month to the day after we stopped turning out weapons, the first Electrolux came off the line. And exactly 20 months later we had built the millionth unit.

There were many headaches between those two figures. Our old bench method, with on-the-floor storage of parts, continued as usual while we tried to fit the overhead conveyor system into the layout. The problem was aggravated by material scarcities of many kinds and necessary changes in methods. Our works manager had given orders that current production

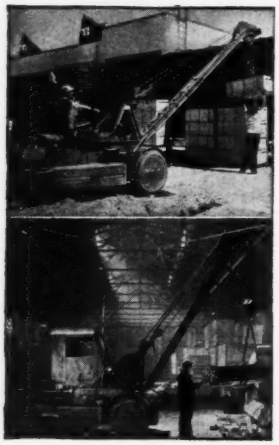


THIS CONVEYOR supplies motors and rear covers. See description of work carriers.



CABINET-TYPE CARRIERS deliver front covers and filter housing to second belt line.

KRANE KAR HANDLES MATERIALS FASTER—INCREASES PROFITS



KRANE KAR speeds materials-handling and increases productivity. ***KRANE KAR*** quickly pays for itself, gives years and years of efficient service. Gasoline or Diesel; pneumatic or solid rubber tires; 9 to 37 ft. booms or adjustable telescopic booms; 1½, 2½, 5 and 10 ton capacities. One man operates both Travel and Crane controls.

KRANE KAR picks up, carries, swings, and places loads of any shape or size up to 10 tons. Loads and Unloads freight cars, trucks, barges... Tiers, Stacks, and Stores materials inside the plant or in the yard... speeds plant Maintenance and Repairs. Ask for our new Bulletin No. 69.

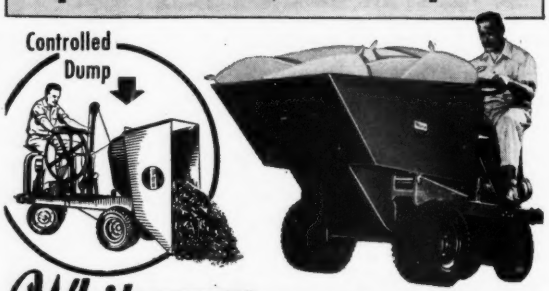
USERS: U. S. Steel, Ford, Chrysler, General Motors, Monsanto Chemical, Bethlehem Steel, DuPont, Westinghouse, General Electric, Todd Shipyards, etc.

THE ORIGINAL SWING BOOM MOBILE CRANE
WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER
1½, 2½, 5, AND 10 TON CAPACITIES

KRANE KAR
TRADE MARK REGISTERED

SILENT HOIST & CRANE CO., 888 63rd ST., BKLYN 20, N.Y.

Hustle 5 wheelbarrowsful per load... at 10 m.p.h.



Whiteman POWER BUGGY

will easily carry anything you can load in or on it. Does the work of 6 men. Controlled dump makes it easy to pour wet concrete, or part of a load. Turns on a dime. For maintenance or moving bulk materials, it quickly pays for itself.

Capacity: 2000 lbs. or 12 cu. ft.
•
7 H.P., 4 cycle, air cooled
•
Turns in radius—reverses
•
Heavy Steel Bucket 34" high
•
Fits through doorways
•

WRITE FOR PRICES AND ILLUSTRATED LITERATURE

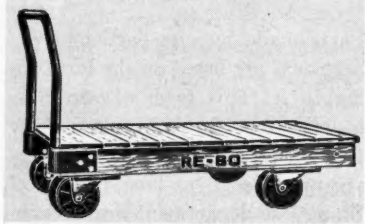
Whiteman MANUFACTURING COMPANY
3249 Casitas Avenue Los Angeles 26, California

must not be disrupted while the new lines went in. At an especially critical period during the installation, several of us went to him to present our problem and ask him how we could keep production and the installation job going on side by side. "Follow the resolution of the good alderman of Cork," he said. We asked him what he meant. "Build the new structures on the site of the old ones, use the materials of the present if necessary, but continue to use the old equipment until the new is ready. Everybody must have an opportunity to work full time."

That's what we did. And that explains how we managed to complete the millionth cleaner 20 months later.

(See the article "Packing Geared to High-Volume Production" in the Packaging Mechanics Section of this issue. It describes the packing methods developed for Electrolux cleaners.—Ed.)

THE NEW *Thrifty Jr.*



If light loads are to be handled, this is your truck!
1000 lb. capacity
Pressed Steel Casters
Steel or Rubber Wheels with Plain or Roller Bearings.
The lowest priced truck of its kind on the market.
WHY SPEND MORE?

Quick Deliveries
Send for Bulletin "Jr."

Plant—Bedford, Va.

RE-BO MANUFACTURING CO., Inc.
331 Madison Ave., New York 17

The HERTNER Motor-Generator BATTERY CHARGER

Type "H" Single Charger

GET *Maximum* PRODUCTIVE OPERATION *from Battery-Powered Hand-Lift Trucks with a*

HERTNER Type "H" MOTOR-GENERATOR CHARGER

FULLY AUTOMATIC Requires no attention during operation. Simply plug in battery and set charge control switch. Cannot overcharge. Automatically cuts off when battery reaches fully-charged condition.

PROTECTION Reverse-current protection. Battery cannot drain back through motor-generator even in event of a power failure.

PACKAGED UNIT Complete with automatic charge terminating controls and charging cable. Compact, single-unit construction occupies minimum space. Nothing else to buy.

ECONOMICAL No costly elements to replace. Requires minimum maintenance. No heat loss due to resistors on single-circuit chargers and extremely low heat loss on multiple circuit chargers. Current is never wasted, because overcharging is impossible.

DEPENDABLE Maximum charging time 8 hours for lead-acid batteries; 7 hours for nickel-alkaline batteries.

CONVENIENT Control board at "top-of-desk" level—meters easily read—control switch right at hand. Charger may be placed directly on floor without losing operating convenience. Batteries may be charged without removal from trucks.

APPROVED DESIGN Cabinet is a conventional style with the motor-generator operating in a horizontal position, providing safe, slow speed of 1750 R.P.M. Designed in accordance with Battery Manufacturers' recommendations. Meets the standard specifications of the Electrical Industrial Truck Association.

Write for bulletin 101 describing Type "H" single-battery charger. Other single and multiple chargers available for all types of batteries. For details send us your requirements.

Hertner
THE HERTNER ELECTRIC COMPANY
12690 ELMWOOD AVE. • CLEVELAND 11, OHIO
A General Precision Equipment Corporation Subsidiary
MOTORS • MOTOR-GENERATORS • GENERATOR SETS

BRUSCO ENGINEERED MATERIAL HANDLING EQUIPMENT

FABRICATORS for PRODUCTION EFFICIENCY

Brummeler Products are engineered to help move your products faster and better through your production line. Regardless of your material handling problem, our Brusco Engineering Department will be glad to work out the best answer, one that will be profitable for you. Brusco originates, designs, and produces any special material handling equipment needed to fulfill any requirement.

BRUSCO ENGINEERING AND FABRICATING SPELL EFFICIENCY IN PRODUCTION

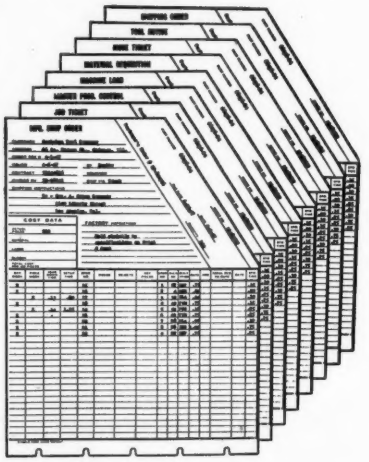
A few of the popular Brusco items include:
A — Style "C" Brusco Drop-Door Parts Box with Adjustable Stand
B — Casting Cooling Box
C — Ring Gear Truck
D — Brusco Dump Hopper
E — Brusco Steel Pallet
F — Heavy Duty Drop-Door Box
G — Automotive Panel Rack

BRUMMELER STEEL PRODUCTS CORPORATION
DEP'T 55 GRAND RAPIDS, MICH.

RECORD FORMS . . .
(Continued from page 24)

next phase as shown on the card. Meanwhile, the foreman crosses off the completed operation, fills in time and material data, and returns his copy to the production record center. The master record is brought up to date by this report. If a graphic device is used, the changes are also made on it.

Another type of control utilizes special forms in conjunction with a breakdown of the master order.



Duplicate Orders are made for each department in vertical system.

Parts made by one particular department are listed on the form going to it. This form of record is usually used in industries where extremely large numbers of pieces are produced over long periods of time. The department head is provided with separate report forms on which he lists the daily output for transmittal to the control center. He retains the original work order card for departmental production records until the assignment is completed.

Still another control system employs a tailored form which travels through the entire production cycle with the work. The form consists of a work order on the major portion and a row of stubs along one side. As a process is completed, the foreman fills out one stub, detaches it from the card and sends it to the record center where the

progress is noted on the master order. The remaining stubs and order are sent along to the next department with the work in process.

Function of Control

It is apparent that the various types of records used in the different systems serve to bring information to the production control center in the simplest and most complete manner. The changes made in the master orders and visual devices can be evaluated each day.

The production manager can compare production with the goals set for that particular date. Where lags are noted, corrective steps can be taken before bottlenecks occur all along the line.

Keeping all phases of production on schedule is extremely important if delivery promises to customers are to be maintained. Only in rare instances is it possible to make up lost time during a succeeding operation. Making prompt deliveries to customers builds good will for the plant, brings in return business and maintains a high employment level.

Every plant is operated for a profit. Cost of its products must be determined so that a price can be set. It is up to production control to maintain operations at a profitable level. As long as the production pace is maintained according to schedule, the per unit cost is according to standard. When production lags, per unit costs increase because labor, overhead, administrative and other expenses continue to add up. Fluctuation in costs are prevented by accurate up-to-date production records which signal bottlenecks in certain departments and enable corrective measures to be instituted. Production within budgetary limits is facilitated.

Production with budgetary limits is made possible through the use of a system of accurate records.

ACKNOWLEDGEMENT

FLOW acknowledges with thanks the photos, forms and data provided in connection with this article by: Remington Rand, Inc., Diebold, Inc., Visi-Trol Corp., Spiral Mfg. Co., Visi-Record, Inc., and Produc-Trol Co.

Here's Your GUIDE to Future CRANE & HOIST Purchases

USE COUPON

NAME.....
COMPANY.....
STREET No.....
PLEASE SEND CATALOGS AS CHECKED
CRANES ☐ (Check) HOISTS ☐
.....TITLE.....
.....STATE.....

• It's a simple matter to open this catalog and put your finger on the Euclid Crane that will meet your requirements.

The type of hoist best suited to your needs — the most economical capacity — how to install and the type of control most satisfactory for you are explained in the Hoist Catalog.

Clip the coupon to your letterhead and mail to us TODAY.

THE EUCLID CRANE & HOIST CO.

1362 CHARDON ROAD • EUCLID, OHIO

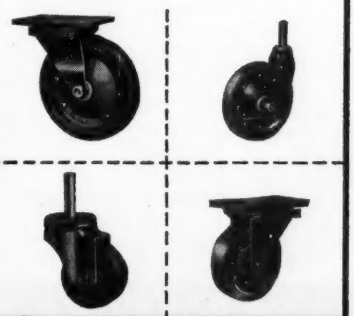
EUCLID CRANES AND HOISTS Raise Profits

CASTERS

Colson

Your *one source* of quality casters of all sizes and types — straight, threaded, or extension stems; socket angle head, or flat plate mountings; swivel and rigid forks; ball, "Durex," and sleeve bearings; wheels and tires of cushion rubber, steel, or alloy.

WRITE FOR CATALOG



THE COLSON CORPORATION
ELYRIA, OHIO
Sales Offices and Dealers in Principal Cities

TRUCKS

Colson

There's a Colson truck for every move you make. Light and heavy duty hand trucks, drum and barrel trucks, dollies, and lift jack systems —all designed to reduce handling costs. *Write for Catalog.*

THE COLSON CORPORATION
ELYRIA, OHIO
Sales Offices and Dealers in Principal Cities

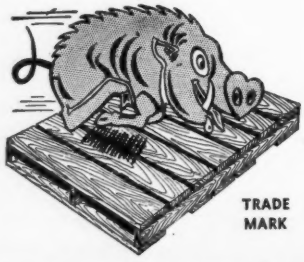
New "Razorback" 4-Way Corner-Lock PALLET

OUR NEW STYLE 5, 4-way Pallet for hand trucks and fork trucks. Corner-lock construction. Made entirely of cottonwood, noted for its toughness and light weight. Made only in 40"x48" size, for use in freight cars and trucks. Weight, 55 pounds.

Write for New Descriptive Circular of Complete Line

PROMPT DELIVERY

All Pallets other than Style 5 available either in cottonwood or hardwood, with rounded corners if desired. All our Pallets made with dry deck boards, pre-drilled before nailing to avoid excessive splitting.



TRADE MARK

ARKANSAS PALLET CORP.

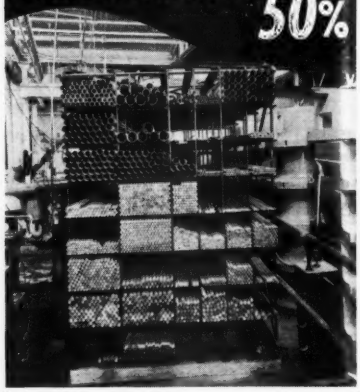
Plant and Sales Office in

PINE BLUFF, ARKANSAS

P.O. Box 794-A **Phone 3244**

ECONO-RACK

INCREASES YOUR STORAGE SPACE AS MUCH AS 50%



THE RUGGED, FLEXIBLE MODERN STORAGE METHOD

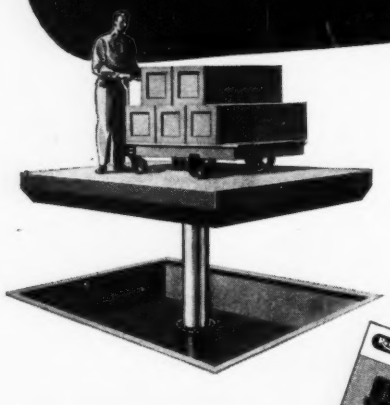
For storage of bar steel, plates, palletized material, etc. ECONO-RACK has a wide range of uses. Saves space, provides easy access to stock, simplifies inventory. Inexpensive.

Descriptive bulletin ER-102 sent on request or ask for quotation based on your specific requirement.

ABELL-HOWE CO.
Engineers—Contractors—Manufacturers
53 W. JACKSON BLVD. • CHICAGO 4, ILL.

NEW LIFTING EQUIPMENT

Uses Economical Oildraulic Power



Use Oildraulic power to lift loads directly from plant floor to trucks, freight cars or different building levels. Rotary Levelators speed plant traffic, conserve manpower, cut costs. Save plant space, too . . . no need for ramps. Plant floor can be poured at grade. Safe, dependable, economical. Installation simple and inexpensive.

FOR COMPLETE DATA WRITE FOR CATALOG RE-201→

ROTARY LIFT CO.
1154 Kansas
Memphis (2), Tenn.

Rotary® LEVELATOR® LIFTS

*Reg. U. S. Pat. Ofc.

Replacement Metal Wheels

- **Smooth Flat Treads**
- **Cast Semi-Steel**

Buffalo wheels have smooth flat treads, and the full tread width bears on the floor. Thick rims and unusual spoke design give exceptional strength. Plain or roller bearings. We serve resale dealers and original equipment manufacturers.

SPECIFICATIONS

Wheel No.	Wheel Size	Bore	Hub Length
250	2½x1¼	½	1 7/16
300	3 x1⅜	⅜	1¾
350	3½x1½	⅜	1¾
404	4 x1½	½	1¾
410	4 x2	½	2½
501	5 x2	½	2½
106	6 x2¼	½	2½
600	6 x2¾	¾	3⅛
107	7 x2¼	½	2½
108L	8 x2	¾	3⅛
108	8 x2¾	¾	3⅛
109	9 x2½	1	3⅛
110	10 x3	1 7/16	3⅞
112	12 x2	1	2 7/16
112W	12 x2½	1¾	3⅛
118	18 x2¼	1	2¾

Buffalo CASTER & WHEEL CORP.
182-6 Breckenridge St., Buffalo, N. Y.

LIFE SAVER . . .
(Continued from page 16)

Efficient Supply of Carton Stock

The batteries of packaging machines are set up in two rows adjacent to a double eight-inch belt conveyor, which divides the layout into two equal parts. The high-capacity packaging machines run more than 100 rows of 11 individual tablets per minute. (Each row becomes a five-cent roll wrapped in wax paper and aluminum foil.) At the discharge end of each machine the rolls are delivered on a metal-top table (adjacent to the eight-inch take away belt), as shown.

The operators at the tables place 20 rolls in a carton. Ten inches above the narrow belt line runs an overhead chain conveyor, which supplies the empty cartons to the

READIED FOR SHIPPING. Packages arrive via vertical conveyor and inclined gravity roller section on belt along which packers are shown.

packers. The carriers, spaced on 36-inch centers, have a wire mesh bottom and end walls, leaving the sides open and permitting the operators on both sides of the line to remove the empties. Three vertical rods attached to a crossbar at the top and a metal strip at the bottom create four spaces. Two of these are used for the bottoms of the cartons, two for the tops. The overhead chain conveyor usually travels at the rate of 15 F. P. M., but has a variable speed drive for adjustment to different production requirements.

The packaging material supply line runs for a distance of 60 feet between the two batteries of packaging machines. The baskets are loaded in the box forming department on the fourth floor. The total length of this closed circuit is 240 lineal feet.

As previously indicated, the take-away conveyor, running below the carton supply line, consists of two separate endless belts, one above the other.

The top belt is usually used for moving out the candy of the flavor constituting the main run on any particular day, packed on the east side of the layout. The lower belt carries the packages containing the mixed flavor candy. The full cartons from both lines are discharged on two curved sections of gravity roller conveyor, each feeding to a wax paper wrapping machine. These two pieces of equipment are set up parallel to each other at the end of the layout. The wax wrapper of course serves to maintain the freshness of the product and to keep moisture out.

From the discharge end of each wrapping machine the individual cartons slide through a chute to a vertical conveyor, which consists of chain-mounted L-shaped carriers spaced at eight-inch centers. Each carton is thus carried down on the ledge of an "L" to the second-floor packing shipping department. As can be seen from one of the photos, the packages are discharged from the vertical conveyor onto a 25-foot-long section of inclined gravity conveyor, whose one-inch rolls are mounted on 1½-inch centers. In rapid succession the packages thus arrive on an 18-inch belt line running at right angles to the gravity roller section.

Operators stationed along the canvas belt pack the packages into corrugated shipping containers. The full cases are fed over a gravity line to a case sealer and compression belt. The completed cases are stacked on skids for movement by hydraulic hand lift truck to an elevator for loading in box cars on the ground floor level. This applies to carlot shipments. Cases for small orders, consisting of a few cases of each of several flavors, are routed to the first floor over a spiral chute for stenciling and other shipping preparations.

INDUSTRIAL TRUCKING FLOORS
Resurfaced to withstand any traffic . . .

with CAMP'S No. 7 INDUSTRIAL FLOOR RESURFACER

Tougher than Steel—Easy to Apply

COSTS ONLY $15.00 PER 100 SQUARE FEET

Camp's No. 7 is applied like cement over your present wood or concrete floors. A ¼ inch thickness resurfaces worn or rough concrete floors to withstand any traffic. Sets in three or four hours—ready for heavy trucking in 24 to 48 hours. Camp's No. 7 comes ready to mix—nothing else needed. Your choice of brown, red and natural dark gray.

Order a trial unit—you must agree it is the best resurfacer you have seen, or there will be no charge.

EVERY INSTALLATION UNCONDITIONALLY GUARANTEED

Further information describing this and other Camp's flooring material sent on request.

The CAMP COMPANY
6958 S. State St., Chicago 21, Ill., Triangle 4770

from COAST TO COAST

Barber-Greene

Sensational

NEW CAR UNLOADING TEAM!

unloads car of coal, rock or crushed stone in 45 minutes!

358 B-G HOPPER CAR UNLOADER

Here's a rugged all-material unloader that's completely new in design. The 358 cuts hopper car unloading time as much as 90% — unloads most any bulk product from fine sandy material to large-sized aggregates and coal at capacities up to 3 tons per minute — empties a 60-ton car in as little as 45 minutes without jam-ups or delays. There's *positive material flow at all times.* Easily "spotted" in track pit or above rails — really portable — can be towed at normal traffic speeds.

363 B-G PORTABLE CONVEYOR

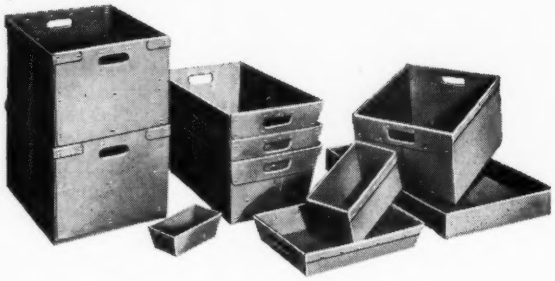
The newly designed B-G Model 363 Portable Conveyor is an extremely flexible machine that will prove to be profitable to yards, industrial plants, contractors, etc. Speeds up stock-piling or transfer of material from car or stock pile to trucks. Entirely new in design, the 363 features V belt drives, pneumatic tires, shock absorbers, towing hitch, and a host of new improvements. Send for new attractive literature on these two great B-G machines.

BARBER-GREENE COMPANY
AURORA, ILLINOIS

Constant Flow Equipment

CONVOY TOTE BOXES

Increase Payload . . . Reduce Cost



LIGHTWEIGHT—2 cu. ft. Convoy Stacking Tote Box weighs only 8½ lbs.

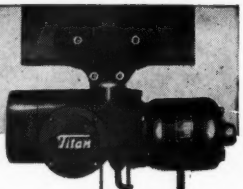
CHEMICALLY HARDENED CORRUGATED BOARD Many Convoy Tote Boxes have been in active daily use for more than two years — exclusive chemical impregnation process binds and hardens corrugated board.

NO MAINTENANCE—Convoy Tote Boxes are so inexpensive that they can be discarded when they finally become unserviceable.

Over 40 Stock Sizes Available Now
. . . Write for sizes and prices

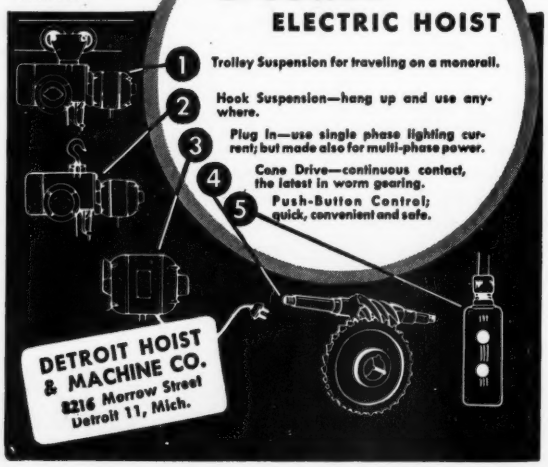
CONVOY, INC. • **CANTON 7, OHIO**

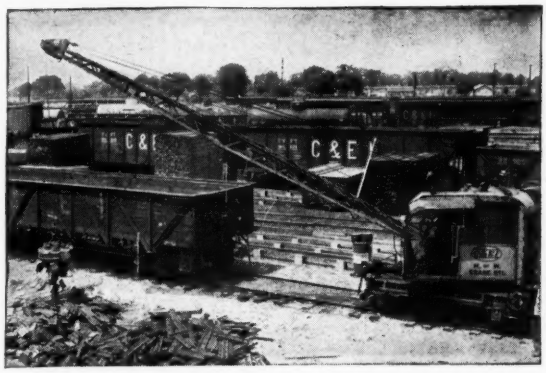
The SMALL hoist with the BIG hoist features



The Titan is a compact, lightweight, electric hoist; easily installed, simple to operate. It is inexpensive to buy, costs practically nothing to operate, handles loads up to 750 pounds; is fast and makes handling safer for both men and materials

Ask For further information on this time saver and production increaser; also for Titan Bulletin 801.


Titan
ELECTRIC HOIST
1 Trolley Suspension for traveling on a monorail.
2 Hook Suspension—hang up and use anywhere.
3 Plug In—use single phase lighting current; but made also for multi-phase power.
4 Cone Drive—continuous contact, the latest in worm gearing.
5 Push-Button Control; quick, convenient and safe.
DETROIT HOIST & MACHINE CO.
8216 Morrow Street
Detroit 11, Mich.



EASY MATERIALS HANDLING

BURRO takes materials handling jobs like this in stride . . . does them with the same smooth speed and economy characteristic of this powerful, speedy locomotive crane, whether it's working with clamshell bucket, tongs, magnet, drag-line bucket or hook.

BURRO'S heavy draw bar pull (7500 lbs.) and fast travel speeds (up to 22 MPH) make it an efficient switch engine too. You can spot cars *where* and *when* you want them, eliminating the "waiting time" which interrupts production and increases costs.

Write for illustrated Bulletins.
There is no obligation.

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

1320 South Kilbourn Avenue — Chicago, Illinois

SPEED UP YOUR HANDLING JOBS WITH *La Ray* MOBILE GANTRY TOWERS

La RAY MOBILE GANTRY TOWERS

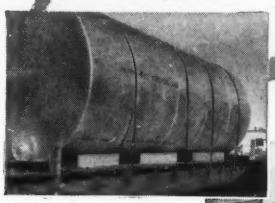
Lift up to three tons with these super-strong, extra-safe La Ray Mobile Gantry Towers. You'll find them ideal for speeding up materials handling in production or maintenance service. Each tower, painted standard safety yellow, has a ladder built into it and rolls on heavy-duty ball-bearing swivel casters.

Write for complete information.

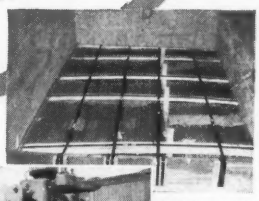
WEISHOR CORPORATION
1029 N. 7th St., Milwaukee, Wis.
MANUFACTURERS OF *La Ray* PRODUCTS

BULKBINDER

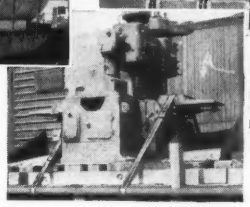
. . . makes big loads sit tight, ends claims, cuts costs



BIG TANK, Bulkbinder braced for safe transit and low cost loading and unloading.



STEEL RODS stay put till the end of a long haul, thanks to Bulkbinder bracing.



HEAVY MACHINERY, Bulkbinder bound and braced, rides a fast freight in perfect safety.

Where the load is heavy, there is no better way to assure safe arrival than to bind the product and brace the car the Bulkbinder way. The versatility of Bulkbinder Strapping Tools and the range of Bulkbinder strap and accessories give you the complete answer to all your heavy duty strapping problems. An A. J. Gerrard Strap Man will gladly discuss your problems with you. Look him up now, in your local phone directory.

BULKBINDER...
strapping tool
sealer

• The right combination for heavy duty strapping jobs. Sold outright, not leased.

Mail this coupon!

A

☐ Send free, Bulkbinder and Steelbinder booklets
☐ Our packing-shipping problem is (name of "problem" product)

_____

Can we use the Bulkbinder on our product?

Company Name _____

Address _____

Attention of _____

STEEL STRAPPING

485

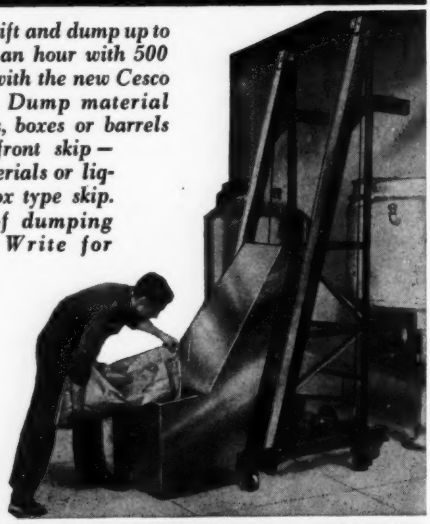
A. J. Gerrard & Co.

221-A N. LASALLE ST., CHICAGO 1, ILL.

CESCO DUMPER

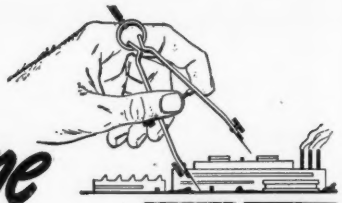
LIFTS and DUMPS UP TO 50,000 LBS. IN ONE HOUR

You can lift and dump up to 100 trips an hour with 500 lb. loads with the new Cesco Dumper. Dump material from bags, boxes or barrels in open front skip — loose materials or liquids in box type skip. Choice of dumping heights. Write for catalog.

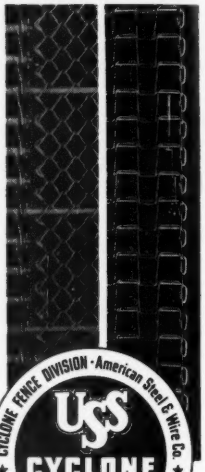


COLSON EQUIPMENT & SUPPLY CO.

1317 WILLOW STREET LOS ANGELES 13, CALIFORNIA



Cyclone



Metal Conveyor Belts... tailored to your operation

Cyclone engineers and technicians will study your operations and design a Cyclone Belt to fit your plant. Cyclone has been making metal belts for industry for over 25 years.

Cyclone Conveyor Belts are made in *Chain Link, Flat Wire* and *Flex-Grid* styles. When made from the right metal, they are impervious to steam, water, oil, heat or chemicals.

Write for FREE catalog No. 4

By the makers of Cyclone Fence

CYCLONE FENCE DIVISION
(AMERICAN STEEL & WIRE COMPANY)
Dept. A-68, Waukegan, Illinois
United States Steel Export Co., New York

CYCLONE FENCE DIVISION · American Steel & Wire Co. · USS CYCLONE "Red Tag" CONVEYOR BELTS · UNITED STATES STEEL

UNITED STATES STEEL

All Vehicles Reconditioned and Sold With New Truck Guarantee

TERMS IF DESIRED $50-$1000-1 YEAR

If Your Lift Is the Wrong Size — Trade for One of These

ELECTRIC FORK TRUCKS

NOW OFFERING AT A PRICE AVERAGING 60% OF NEW

		Inch Pounds	Height Lift	Approximate New Price	Our Price Reduced To
AUTOMATIC	3,000 Lb.	84,000	72"	$4,675	$2,100
	4,000 Lb.	96,000	119"	$4,825	$3,000
	4,000 Lb.	120,000	61"	$4,700	$2,250
	5,000 Lb.	150,000	119"	$5,100	$3,000
BAKER RAULANG	6,000 Lb.	144,000	60"	$5,500	$3,250
CLARK	6,000 Lb.	150,000	104"	$4,350	$3,000
ELWELL-PARKER	4,000 Lb.	120,000	117"	$4,825	$3,250
	5,000 Lb.	90,000	105"	$4,000	$2,750
	6,000 Lb.	180,000	59"	$5,005	$3,500
MERCURY	4,000 Lb.	120,000	107"	$4,250	$3,000
	5,000 Lb.	160,000	104"	$4,600	$3,250
YALE (Platform	4,000 Lb.			$3,000	$1,500
	6,000 Lb.			$4,000	$1,950
Due to expense of putting gas models in like-new condition, we are continuing our former prices—					
CLARK	4,000 Lb.	60,000	108"	$2,750	$2,100
	6,000 Lb.	150,000	104"	$3,385	$2,400
HYSTER	2,000 Lb.	30,000	104"	$2,150	$1,600
ROSS	6,000 Lb.	150,000	10"	$5,200	$4,000 Unused $3500 Used
ROSS STRADDLE LUMBER CARRIER—	7½ Ton			$6,600	$4,000
	12 Ton				$4,500

The WAA has ceased the sale of lift trucks, due to the present emergency. Therefore, we suggest that you look over the 60 trucks in our stock as we may not have others available when these are gone.
7 small and medium-sized bull dozers and bull clams.
1 ¾ yard Northwest dragline. 4 Model C Turnapulls.

YOU CAN ALSO RENT THIS EQUIPMENT BY THE DAY, WEEK OR MONTH USING YOUR OWN OPERATORS.

HARRY M. RIGHTER, Inc.

Foot of W. 45th St., Cleveland, O. 7:30 a.m.—4:00 p.m. ATlantic 1631
OWNED, OPERATED AND MANNED BY VETERANS OF WORLD WAR II

WORLD'S EASIEST WAY TO OPEN ANY BOX CAR DOOR

NOLAN ONE MAN CAR DOOR OPENER

ONLY $27.50 EACH
F.O.B. Bowerston

One man can open the most binding, balky box car door with the Nolan Car Door Opener. Get greater safety . . . speed loading and unloading schedules . . . order an ample supply to fill your needs today!

● No strained muscles. No slips or falls. No broken arms, legs or mashed fingers. No fatalities. No time wasted. No "gangs" needed. No time loss.

Write for free descriptive literature.

The Nolan Company

110 Pennsylvania Ave., Bowerston, Ohio

Why ENGINEERED DESIGN PALLETS?

A Choose the pallet that is best-suited to handling your product.

B ENGINEERED DESIGN pallets are scientifically tailored to handle your specific product . . . in a way that will reduce operating costs, enabling more economic operation.

Pallets Incorporated

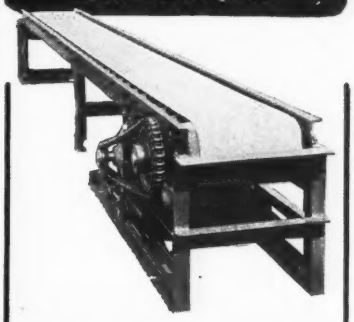
Manufacturers of
ENGINEERED DESIGN *Pallets*
GLEN FALLS, N. Y.

ADVERTISERS IN THIS ISSUE

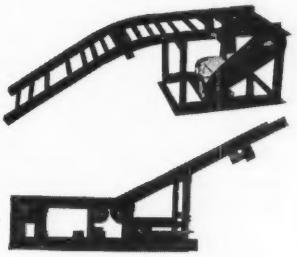
	Page
ABC Packaging Machine Corp.	48
Abell-Howe Company	66
Acme Steel Co.	45
Alameda Distributors	59
American Monorail Co.	Inside Back Cover
Appleton Electric Co.	30
Arkansas Pallet Corp.	66
Automatic Transportation Co.	1
Barber-Greene Co.	68
Bell Aircraft Corp.	25
Bigelow-Garvey Lumber Co.	46
Brummeler Steel Products Corp.	64
Brooks Equipment & Mfg. Co.	56
Buffalo Caster & Wheel Corp.	66
C & D Batteries, Inc.	14
The Camp Co.	67
Clark Tructractor Div.	6 and 7
The Colson Corp.	65
Colson Equipment & Supply Co.	70
Consulting Engineers	35
Convoys, Inc.	68
Cullen-Freistedt Co.	69
Darnell Corp., Ltd.	55
Dempster Brothers, Inc.	10 and 11
Detroit Hoist & Machine Co.	68
Dico Corp.	47
Divine Brothers Co.	58
Downs Crane & Hoist Co.	53
Thos. A. Edison, Inc.	13
Euclid Crane & Hoist Co.	65
Fab-Weld Corp.	47
A. B. Farquhar Co.	28
Flow	18
General Electric Co.	5
General Tire & Rubber Co.	31
A. J. Gerrard & Co.	69
Gould Storage Battery Corp.	21
A. L. Hansen Mfg. Co.	58
Harnischfeger Corp.	Inside Front Cover
W. F. Hebard & Co.	61
The Hertner Electric Co.	63
Homer Mfg. Co., Inc.	54
Hyster Co.	29
Industrial Pallet Co., Inc.	40
Island Equipment Co.	71
The Lanham Co.	35
G. B. Lewis Co.	42
Lewis-Shepard Products, Inc.	43
Marsh Stencil Machine Co.	54
Mathews Conveyor Co.	34
May-Fran Engineering, Inc.	59
Merrill Brothers	43
The Nolan Co.	71
Nutting Truck & Caster Co.	48
Otis Elevator Co.	35
Pallets Inc.	71
Palmer-Shile Co.	72
Pittsburgh Steel Products Co.	12
The Powell Pressed Steel Co.	8
Rack Engineering Co.	59
Rapids-Standard Co., Inc.	47
Ready-Power Co.	38
Re-Bo Mfg. Co., Inc.	63
Harry M. Righter, Inc.	70
Robbins & Myers, Inc.	41
John A. Roebling's Sons Co.	9
Rolock, Inc.	42
Ross Carrier Co.	46
Rotary Lift Co.	66
Schwitzer-Cummins Co.	40
Silent Hoist & Crane Co., Inc.	62
Speedways Conveyors, Inc.	46
Standard Conveyor Co.	41
Standard Pressed Steel Co.	60
Thomas Truck & Caster Co.	60
Towmotor Corp.	2
Truck-Man, Inc.	51
Truscon Steel Co.	42
U. S. Steel Corp.	70
Weber Addressing Machine Co.	4
Weishor Corporation	69
West Bend Equipment Corp.	57
Whiteman Mfg. Co.	62

ISLAND ULTIMATE

Stationary Medium Duty Horizontal & Incline Belt Conveyors

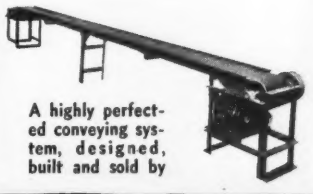


Medium Duty Horizontal Roller Unit with combination power and take-up unit and fixed idler end.



Horizontal Feed & Snub Section and Power Unit with Horizontal Discharge and Gooseneck of Ultimate Belt.

Medium Duty Horizontal Roller Unit with standard drive and take-up.



A highly perfected conveying system, designed, built and sold by

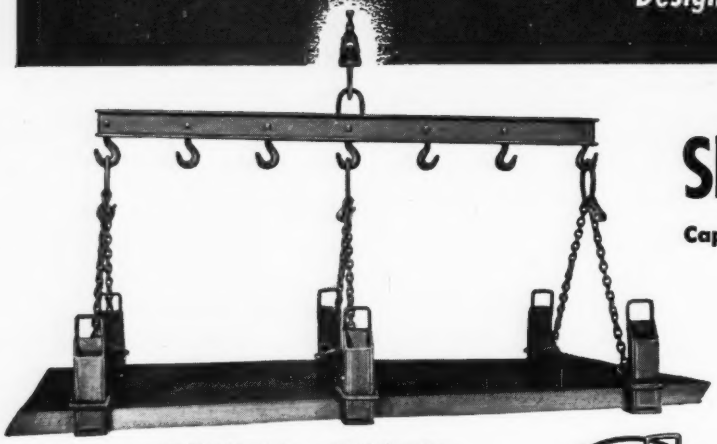
ISLAND EQUIPMENT CORP.

Brewster Rolls Royce Building
37-01 Bridge Plaza, North • Long Island City 1, New York

PALMER-SHILE

MATERIALS HANDLING EQUIPMENT

Designed to do Specific Jobs Better



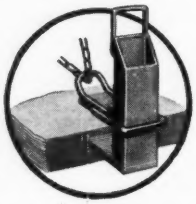
NS-364 Complete
(3 ton capacity)
$150.00

B-704 Complete
(5 ton capacity)
$225.00

SHEET STEEL GRAB

Capacity 1, 2 and 3 tons (1 ton per sling)

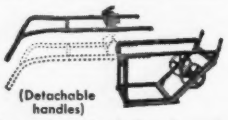
Adaptable to any size lift of sheets within 0" to 9" in thickness, 18" to 48" in width, any length. For short bundles use one grab without beam, for average bundle use two grabs—for long, flexible bundles use three grabs. As illustrated, handles three tons. Holds without slippage, distortion or damage to stock. Adjustable for low head room. Supporting beam 6 feet long—carefully engineered and heavily constructed for extra safety and service.



We Design and Build all types of pick-up, loading, moving, shipping, dumping and storage materials handling equipment.

NS-506DH
(Detachable handles)
$44.50

Combination Truck and Drain Rack

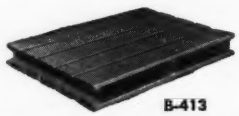


(Detachable handles)

Automatically loads barrels up to 1,000 lbs. with ease. Heavy all welded angle iron frame, tubular handles, free rolling wheels. Detachable handles for storage.

Industrial Dust Pan
S-703
$19.50

Sturdy, light to handle. Basket 16 gauge sheet steel 18" x 18" x 18"—frame all welded construction—8" rubber, ball bearing wheels. Wt. 45 lbs.—capacity 1 bushel.



B-413

Double Face All Metal Pallet

Built for extra heavy duty—two way—for power fork truck only. Special rolled steel, corrugated. (Other sizes, types to order.)

NS-21M
(Metal Wheels)
$38.50

NS-21R
(Rubber Tired Wheels)
$46.45

Turn Table Tilt Truck

All purpose use in warehouse or factory—turns in own radius. Platform 1½" hardwood 48" x 28"—reinforced. Roller bearing wheels — two swivel type. Wt. 75 lbs.

Trunnion Box Truck

Speeds handling. Of heavy bar stock, well reinforced, tubular handles, welded construction. Two 10" roller bearing metal wheels.

B-268 $45.00

B-290 T Box $18.65

12 gauge steel plate square trunnion box—18" x 18" x 24". (Minimum lots of 10.) Wt. 80 lbs.

B-205
$15.00

Drum and Barrel Sling

Handles barrels, drums, kegs—anything with a lip. Half ton capacity. Heavy welded chain and forged grab hooks. Wt. 8⅗ lbs.

Two Wheel Hand Truck

With safety knuckle guards—straight back for handling boxes, crates, bags, etc. Heavy 7" nose plate. Reinforced welded angle iron frame.

B-439ML $24.50
20" wide, 48" high, metal wheels

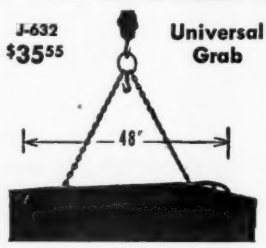
B-439MS $20.00
18" wide, 42" high, metal wheels

B-439RL $28.25
20" wide, 48" high, rubber tired wheels

B-439RS $25.00
18" wide, 42" high, rubber tired wheels

J-632
$35.55

Universal Grab



Hook type, picks up heavy boxes, crates, bales, from 16" to 48" across. Heavy forged steel hooks with adjustable spread. Capacity 2,000 lbs.

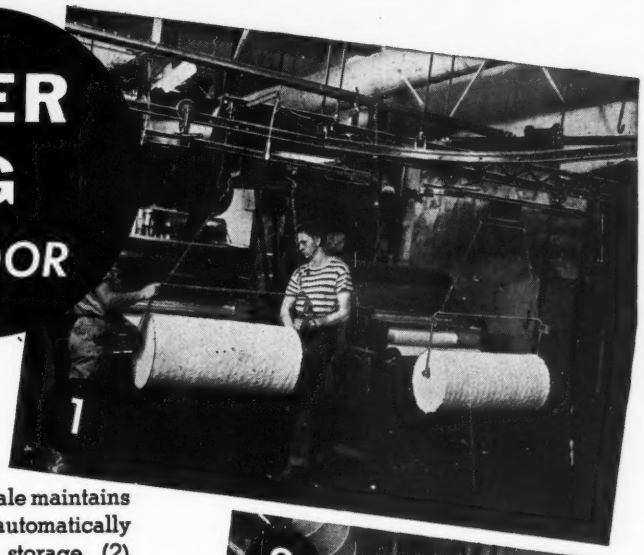
When Ordering
give item number to prevent error. All weights approximate, all prices f.o.b. Detroit, Mich. Prices subject to change without notice.

DESIGNED AND MANUFACTURED BY

Palmer-Shile Co.

16012 Fullerton Ave., DETROIT 27, MICH.

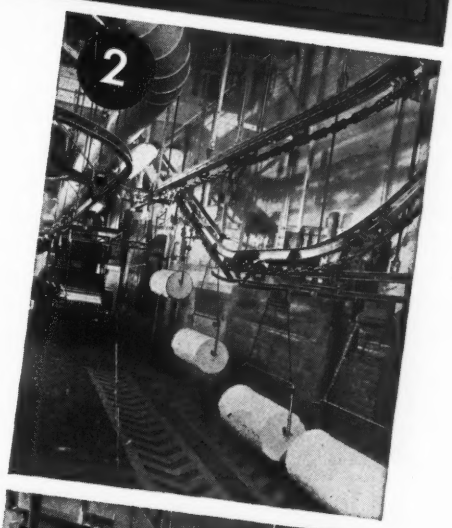
UP and OVER HANDLING
from FLOOR to FLOOR

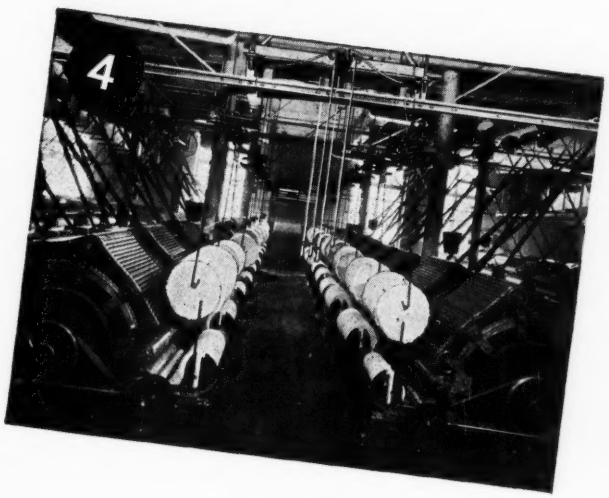


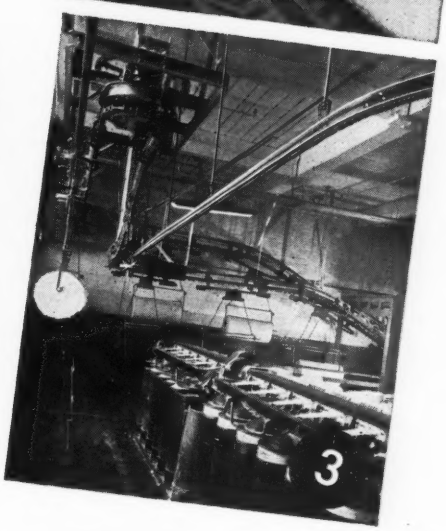
These pictures tell an unusual story of the versatility of American MonoRail "Up and Over" Handling. (1) Cotton laps are loaded on carrier at pickers. Carriers roll by gravity to scale where weight is checked. Automatic reject at scale maintains tolerance within one-half pound. Good laps feed automatically to conveyor. Rejects roll by gravity to rework storage. (2) Carriers automatically engage with booster system for transfer to card room on floor above. (3) Loaded carriers roll by gravity to storage track. Empty lap rods return for transfer to pickers on the floor below. (4) Operator pulls off nine carriers at a time to creel a row of cards.

The only manual handlng in this entire system is loading of laps at picker. Automatic handling eliminates torn laps caused by manual handling. Electric eye automatically shuts off entire system in case of overload.

American MonoRail engineers can show you how it is better, quicker and more economical to handle your material with "Up and Over" American MonoRail Handling equipment.







THE AMERICAN MONORAIL COMPANY

13129 ATHENS AVENUE CLEVELAND 7, OHIO

46 JOBBERS
24,673 AUTHENTICATED
READER BUYERS

TO
REACH THE BUYERS
USE . . . .

THE "C.B.P." Plan

FOR

- √ *Authenticated Readers*
- √ *Complete Market Coverage*
- √ *Lowered Sales Costs*
- √ *Greater Sales Volume*

THE WHY! WHAT! and HOW! of C. B. P.

Currently FLOW has over 24,000 readers. In addition to the C C A QUANTITY guarantee of circulation, FLOW now gives the advertiser an added quality value through the C B P (Certified Buying Power) plan. The plan was established after carefully selecting 46 outstanding material handling equipment jobbers located in key marketing areas throughout the nation.

EACH JOBBER—A FLOW CIRCULATION MANAGER

Each jobber subscribes for his active and most important material handling equipment customers, and for his best prospects. The jobber pays us $1.20 per year per subscription. These constitute an "identifiable" readership composed of authenticated, known buyers and users . . . the jobbers being the authenticating agents! Thus—under "C B P"—Readers-Buyers become synonomous and interchangeable . . . adding the missing sales link for the advertiser. Regardless of whether you—as the manufacturer—sell direct or through jobbers—FLOW guarantees CERTIFIED BUYING POWER. These 24,000 reader-buyers comprise the known national market for material handling equipment and, therefore, are the people to whom you must tell your story. FLOW reaches more than just "people"—or "names"—or "positions"—it reaches BUYERS. Here is "CERTIFIED BUYING POWER"—around which you can most profitably build your sales and merchandising campaign.

Flow MAGAZINE